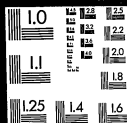


CENTIMETERS



14:1

Thomas A. Edison Papers

A SELECTIVE MICROFILM EDITION PART V (1911-1919)

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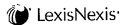
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Thomas A. Edison Papers
at
Rutgers, The State University of New Jersey
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START

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A Note on the Sources

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**NOTEBOOK SERIES
NOTEBOOKS BY EXPERIMENTERS
OTHER THAN EDISON**

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- W. W. Dinwiddie Disc Books**

These twelve notebooks relate to the work of William W. Dinwiddie and his assistants on the composition and manufacture of disc records during the years 1918-1920. The experiments are numbered from D1 through D821, although not all numbers have been used. Edison's involvement in the research is indicated primarily by the comments of other experimenters; there also infrequent notations and instructions in Edison's hand. Included are experiments aimed at producing the "perfect" record blank in terms of ingredients, varnishes, and the manufacturing process (mixing, pressing, baking, molding, and printing). Also included are occasional entries listing various chemicals and their characteristics or sources of supply, presumably to determine the best ones to use in the experiments.

Experiments by Dinwiddie that are related to, but not directly connected with, the "D" experiments are described in N-19-08-20 [not selected]. The entries in N-19-04-23.1, N-20-03-01.1, and N-20-04-12 [not selected] are by Dinwiddie's assistants, Henry G. Atkinson, W. R. Simpson, Henry E. Thayer, and John Weichmann. The notes also indicate the involvement of Charles T. Dally, E. E. Dougherty, Charles G. Kircher, Ludwig F. (Louis) Ott, and others. Some of the experiments involve the use of mixes prepared in the C. T. Dally Disc Blanks Composition Books. Some of the "D" blanks described in Dinwiddie's books were used for further experiments documented in Dally's books.

Four notebooks, representative of the work in the other books, have been selected for their numerous references to Edison's involvement in the experiments.

N-Number Labels and Inscriptions on Front Cover

Selected Books

18-04-30	"Dinwiddie D-1 -- 100"; "Disc Records"
18-08-14	"Dinwiddie D-101 -- 200/++"
18-12-07	"Dinwiddie Varnish D-201 - Next book is 401 - "
19-01-10.1	"Dinwiddie D 401 -- "; "Disc"

Books Not Selected

19-02-06	"Dinwiddie D-501 -- 597"; "Disc Records"
19-04-23.1	"W.R. Simpson Edison Laboratories"; "Disc Records"
19-05-20	"Dinwiddie 601 --"
19-08-20	"Clay 1919 W.W. Dinwiddie"
19-09-04	"Dinwiddie -- D 701 - 1919 & Stripping Nickel"
20-03-01.1	---
20-04-12	"Henry George Atkinson. John Weichmann"; "Disc Records"
20-04-15	"Dinwiddie D-801 -- "; "Disc Records"

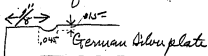
**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- W. W. Dinwiddie Disc Books
Notebook, N-18-04-30**

This notebook was used by William W. Dinwiddie during April-July 1918 for notes relating to the production of the blanks and submasters used in the manufacture of disc records. Edison's supervision of this work is indicated by Dinwiddie's references to his suggestions and by lists of chemicals referred to as "Mr. Edison's." The experiments are numbered from D1 through D100. The entries indicate differing methods of preparation involving variations in the baking schedules and the use of different ingredients, combinations of ingredients, and varnishes. Most entries contain comments about the results of the experiments, including whether the disk was cracked, rough, too stiff, or stuck to plates and molds during printing process. Also included are references to varnish experiments and to "drop tests" that were performed to determine the durability of the experimental blanks and submasters. There are occasional lists of chemicals ("materials obtained in N.Y."), along with notations regarding their characteristics and sources of supply. The notes indicate that Frank Clancy, Charles T. Dally, Charles G. Kircher, and Ludwig F. (Louis) Ott worked with Dinwiddie on these or related experiments. The front cover is labeled "Dinwiddie D-1 — 100" and "Disc Records." The pages are unnumbered. Approximately 110 pages have been used.

II-1

for two claws

Plate in mould for sticking on the
first sheet of celluloid submaster,



Stick on one sheet celluloid with
this plate - using regular schedule
Send with plate to Envidder in
Building 4.

II-2 Make a regular celluloid submaster
with the blank prepared as D-1
6 small gaps are cut in the ridge to
prevent trapping air - Printed with vacuum.
20-10-10.

Print showed full - small blisters
near the center hole. edge seemed to
be a little low.

April 20-1910-

H-8 Submaster blank varnished with
1841-E Varnish and two layers of
blotting paper with 1841-E Varnish applied
to each side, air dried and a second
coat of Varnish applied to top surface -
Baked 1933-E Schedule. (Blister near center)
Revarnished May 1-18 - baked again 1933-E
Stuck to transfer plate and
split the blotting paper -

Contact 4-54-30
2000 lbs 4-58
Between 5-6-30
" off 5-14

split

Apr 20 - 1918

D4. Blanks prepared same as D-3 but
allowed to stand all night before
baking 1933-E schedule - Baked
1933-E.

Heated with "tanning" solution
did not stick to plate - but the
blotter separated.

plates not sold

Steam on 1-17 thru May 1.

1000 lbs 1-23

Water on 1-29

off 1-38-30

D-5 Blank prepared same as D-3
but allowed to air dry 24 hours
then 2 coats 1841 Varnish &
labeled 1933-E.

May 2	Steam on	1-55 Pm	100 lbs steam
	Cont'd	1-56	
1000 lbs	Hydraulic	2-01	
Water on		2-07	
off		2-16	

D-6

Sheet of condemite impregnated
film made by Diamond Plate Fibre Co.,
Bridgeport, Montgomery County, Pa -
placed on disc of Submaster -
slant with platten warm

Steam on 825-

1000 lbs 829

Water on 813

Off 822

looks dirty -
cracked around edges
would be rough from
small lumps of condemite on surface
N. G.

D-7 for Mr Kinsler -

printing press schedule -

Contact pressure until thermometer reaches 200°
hold for 2 minutes more

Then take 2 minutes to come up to
full pressure - Hold full pressure
for 17 minutes then cut it back
slowly (take about a minute) to
contact pressure - This makes 12
minutes after thermometer reaches
 200° - then turn off steam and
cool as usual -

Make one round inspect for
parallel cracks - W.H.D.

12 printed

2 OK.

10 poor prints - There were no parallel cracks.

See D-12

D-8 for Mr. Kuehn -

varnish with one coat regular
varnish - 12 records which have
been discarded for low prints etc
but flanks are sound.

Print regular -

all more discards due to
trapt air - three cracked
across the label and one had
a parallel crack. but all had
the trapt air spots -

May 3-18

D-9

Place disc of blotting paper on a submaster blank - varnish with 2 min viscosity 1841-E varnish before any skins or gas black has been added, put on varnish until it soaks completely, turn the blotter and stick it to the blank - Air dry and lay on another disc of blotting paper and apply varnish as before - Air dry one hour then apply one coat regular 1841-E varnish 5 min viscosity, make 1933-E

May 4 - Stamping press

Stam on 11-03

Contact 11-04 -

1000 lbs 11-10-30

water on 11-15-30

D-10

Name as D-9 except use
only one thickness of paper

May 41 Sketching on press - Press cloth

Stamow 11-33-0

Enclat 11-34-0

10000 11-37

Wateroon 11-44

out 11-54

D-11 For Mr. Clancy
Same plate as D-1 but
width and depth of groove increased
50%

Stick on one sheet of celluloid
with this plate using regular
schedule - send with plate to
Rebuilding 4 - Wood,

D-12 For Mr. Kitcher — Make 12 prints
Printing press schedule -
Contact pressure until thermometer reaches
200°

Hold for 2 minutes more -
Then take 2 minutes to come up
to full pressure -

Hold full pressure for 9 minutes
then take about a minute to
get back to contact pressure
like D-7 — This makes 14 minutes
steam after thermometer reaches 200°
Turn off steam and cool as usual -

all poor prints -
Some cracked across label
also 3 radial cracks

May 3

D-13 two sheets blotting paper soaked with
same 2-min viscosity varnish as used
in D-9 - Hung up to dry exposed to air
on both sides - dry for 24 hours - Then
laid on submaster blank

Steam on 2-45-30
Contact 2-49-30 Could get only 50 lbs steam
1000 lbs. 2-53-30
Water on 3-3-30
off 3-12-30

D-14 -

250g - shellac.

50g - Cotton floc.

325g china clay } mixed together -

325g Russellgum }

50g gas black.

Could not get in more than half
of the china clay and Russellgum -
estimated 150g of each.

250g shellac

50g cottonfloc

50g gas black

300g filler

650g

about 40% shellac

650 250 (39 1/2% shellac)

1950

5500

5200

200

1600

3200

D-15 12 g. gas blacks	16%
50 g. cotton floc.	62%
250 g. T.N. lac	33 1/2%
433 g. China clay	58 1/2%
<hr/> 744 g.	<hr/> 100%

I believe that by using a little less floc that we can get the lac down to 30%

Rec D-16

D-16

300g. T. N. Lac.

25g. cotton flc.

15g. gas black.

(560g) China clay

Could only get in 516g. clay

this makes the TN only 35%

D-17

250 g. T. N. Lac	25%
50 g. Rosin I grade	5%
20 g. Cotton flce	2%
10 g. Coas flach	1%
670 g. China clay	67%
	<hr/> 100%

This was comparatively
little trouble to work. took
the china clay without difficulty.
The greater fluidity and stickiness
of the rosin makes it the more
difficult.

D-18

300 g. T. N. Lac -	30%
20 g. cotton flac -	2%
10 g. gas blash -	1%
670 g. china clay,	67%

When rolls are running when $\frac{3}{4}$ of the china clay has been added put a little denatured alcohol on the roller now and then, to help work in the china clay. This suggested by Mr. Edison.

This worked O.K. but is not as good as the resin D-17

D-19

200g	shellac	20%
100g	Resin	10%
20g	Cottonluc	2%
10g	gas black	1%
670g	china clay	67%

D-20

Took D-17 and laid it on the
hot rolls covered with a newspaper
for about 20 minutes and rolled
it over without any difficulty. —

- ✓ Alcohol too volatile
- ✓ Benzole " "
- ✓ Acetone " "
- ✓ Glycerine not a solvent -
- ✓ Naphthalene no marked effect - possibly slight *
- ✓ Tetra chloronaphthalene not a solvent.
- ✓ Venice Turpentine
- ✓ Copaiba Balsam
- ✓ Turpentine
- ✓ Rock oil
- ✓ Linseed oil
- ✓ Carbon Tetra chloride too volatile.
- ✓ Camphor
- ✓ Kerosene
- ✓ Palmitic acid
- ✓ Stearic acid *

D-21

Small samples of D-17 laid on rolls - then
 at a time and a few drops of various
 solvents added when rolling. See if
 any of them improves the consistency of
 the ~~new~~ mixture.

Stearic acid stops stickiness
 and naphthalene also both lower
 the melting point. Overcomes the
 stickiness introduced by the addition of
 Rosin

D-22

225g T.N. Lac
500g I. Rosin,
25g Venice Turpentine.
20g cotton flce.,
10g gas black,
670g China clay.

D-23

200g T.N. Lac
50g I Rosin
50g Venice Turpentine
20g cotton floc
1.0g gas black
670g. china clay

D-24

250 g. T.N. Lac.	25%
50 g. I. Roim.	5%
(25 g. Naphthalene.)	(extra 2 1/2%)
20 g. cotton floc.	2%
10 g. gas black.	1%
670 g china clay.	67%
	<hr/> 102 1/2%

Probably a large part of this
is lost

D-25

Regular mix for powder blanks

220 Rosin	11%
40 gas black	2%
1080 wood	54%
660 chalk	33%
	100%

Put Rosin on rolls - then
wood - chalk - and gasblack -
Run until it ground up to powder -
then put thru hand coffee mill
to break up the flakes

Made one blank - looks coarse
from the coarse powder but
seems to be well mixed

Varnished 2 coats 5 min visc

1841-E baked 1933-E

Print OK, but rough surface
due to unground powder -

Drops test broke on 2nd drop
but seems to be about as strong
as the regular -

D26 -

Mixed all that was left of
D17-20-22-23-24 and put on
rolls and reheated like D20
worked up into a glob and
painted on wrinkles above 150°F
made a submaster about an inch
thicker material was too stiff
and showed considerable depletion
due to form of glob - 1000 lbs pressure
used.

D-27 same mix as D-24
grt. folded up by hand and
moulded - about 10 which
made an 8th record

Pure weight 937 grams net
Scrap found 4/2
979

D-28

250 g. T. N. Lac

50 g I. Room

25 g Naphthalene

20 g Cotton flc.

10 g gas blck

455 g Kieselguhr

860 g

This is all that I could get in and the mix was then more dry than D-24

The Kieselguhr is very much more bulky than the china clay but when in the mix it does not seem to make the mix more bulky

Specific Gravity determined by
L. Ott - 1.389+

China clay mix No 24 determined same time by L. Ott 1.752+

Print was T.C. too stiff to fill with 1000 lb pressure - flowing badly inside the mould.

D-28

250 g T.N. Lac

50 g I. Resin

25 g Naphthalene

20 g Cotton floc.

10 g gas black

455 g Kieselghur

860 g

This is all that I could get
in and the mix was then
more dry than D-24

The Kieselghur is very much
more bulky than the china clay
but when in the mix it does
not seem to make the mix more
bulky

Specific Gravity determined by
L. Ott 1.389+

China clay mix No 24 determined same
time by L. Ott 1.752+

Print was D.C. too stiff to fill
with 1000 lb pressure - flowing badly
rubbed the mould.

D-29 - Press schedule Experiment.

Run one press with 11 moulds and one dummy in the top space, dummy about $\frac{1}{8}$ inch thinner than a pair of moulds.

Make contact just lifting the 12th platten leaving an air space over the dummy.

Run 2-2-10 schedule
and 2-3-9 "

If this does not give low prints it will save the moulds.
with contact pressure of 100 lbs the top mould has 10,000 lbs to support and bottom mould 10,800 small

D-30, same proportions as D-24 but 10%
greater quantity,

275 g T. N.

55 g I. Norin.

27 1/2 g Naphthalene.

22 g Cotton lye.

11 g gas block.

437 g china clay

1127 1/2 g.

Take 15 minutes from time starting
rolls to get in press under 1000 lbs
pressure -
Print O.K.

D-31

275 g I.N.
55 g I. Rosin
55 g Naphthalene
22 g cotton flax
11 g 900 black
737 g China clay

1155 g total.

double amount in 24
10% larger quantity made -

D-32-

Same as D-31 but did not
have quite enough to fill the mould
used a slightly larger ring.

D-33-

Same mix as D-31
Printed on a master mould that
was very dirty - Clamey said
that printing it once would take
the dirt off but it seemed to get
worse - print sounds very
crackly and surface is only
fair.

D-34-

413 g TN, same proportion as D-24

83 g I Porin.

83 g Napthalene.

33 g cotton flax.

17 g gas black.

1105 g china clay.

Rollled to $\frac{1}{4}$ " thick then
cut out a circle with knife
sheet of dope laid on board and
marked with ring die.

~~16~~
Back of mould covers
 $\frac{1}{16}$ inch. To get the air out, Anter
touches first - makes a record
conserve on the back.

A seam in the gob shows
on the print - But surface is
otherwise good and mechanically OK.

D-35

Same as D-34 except that
only 55 g naphthalene was used,
same dist as D-34 but
not quite so bad - rolls so thin
that there was no surplus to
squeeze out.

D-36

Same as 31 except that
cotton floc used was degreased
and prepared for sunbrella powder-
clean and free from cotton seed
hull -

Surface very much better &
free from cracks, -

Did not make a disc gold-
folded up by hand like 31 ~~but~~
but used the convex back,

D-37

300g T.N.

50g I. Rosin.

40g Cottonflwr.

20g gas black.

590g China clay.

1,000g Total

5/22/18

No Naphthalene used

more T.N.

More cotton flwr - good quality.

More gas black -

Moulded like D-36 - surface shows
effect of a seam in the globe, making
charlier D not moving. Both D-35 and 36
show less deformation than records previously
made with low grade flwr, D 37 shows
some "air swelling" same D 36.

3/23/18

D-38 350 g TN
25 g I Floor
10 g Cotton floe
10 g Gas black
655 g China clay
1050 g total,

very soft -

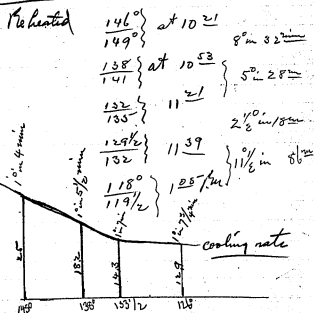
Had mould colder than usual
to prevent sticking as gob was
very sticky.

Made reddish mottled print.
looked like Copper Oxide sticks on
print in the mottles - with supplementary
mottles on mould. Surface not
quite so good as D-86 - but
free from cracks; Microscope
shows that mould was too cold
to allow print to close up perfectly,

D-39 250 g. T.N.
50 g. I Rosin
20 g. Naphthalene
10 g. gas flask.
670 g china clay.

Omission of cotton floss makes
the material very much more
smooth.
Would master lot rather like

start { water comp flow } $\frac{172}{142}$ } 9.22 km ^{Fahrenheit}
 " in tanks $\frac{136}{139}$ } 9.30
 tanks $\frac{134}{137}$ } 9.45
 $\frac{132}{135}$ } 9.53
 Room Temperature } 10.04
 75° F }



D-40 —
 Circulating water in Res from tank —
 Temp of water 171°

Same mix as D-39 water a little
 too cold

D-41

Runs at 133°

Proim mix made by Mr Dally
Water circulation too cold and
too much clay in mix
Broke on extracting

D-42

Circulating water in tank, 199°F
Mix. same as D-39 - folded up
got by hand,
Water temperature in tank is about
3° higher than press,
Print OK, smoothest yet

D43 Same as D42 except that
temp of circulating water is
set 206° in the tank —

D-44 Temp of circulating water
in tube 97° Cent.
Put label on by sticking it on
the short pin for center hole -
in the press the pin is forced thru.
(X) but got a little
rough and got some dirt on it,
same mix as D-39

D-45 - Same as D-44 -

Same mix as D-39 -

OK, except for slightly rough gold.

D46- same proportions as D39

Screened the clay thru 70 mesh, picked over
all lac from clean looking shell lac from
store room - instead of using the ground
T.N. of previous experiments.

Dried chalk in steam oven for 5 hours
after mixing the naphthalene with it.
till naphthalene smell had disappeared
so I put in fresh amount of
20 g. in rolls

Chalk was screened thru 70 mesh
screen.

Worked alone at night June 5 after
dully got thru and got mould too
hot, sticks causing R.D. but I
believe that general surface was
improved by clean shellac -

D-47 -

Same material as D40 & D39 laid
on steam plate and reheated - too
stiff to print out.

Mould and bottom curved plate were
hot and press cold -

Could not make the material into
a grb entirely free from creases -

D-48

300 g. H. W. Peabody (164) stuff -

50 g I. Resin

40 g Naphthalene

10 g gas black

600 g China clay

1000 g -

Took off roll in $\frac{3}{4}$ sheet - allowed to cool - flattened up on hot plate. Rolled up and printed like Pothé.

Shellac seems too stiff and dry even more dry than D 47 but the glob was a little softer.

Try more resin also more clay

D-49

June 8-18

300g TN

50g I Rosin

40g Naphthalene

10g gas blash

500g China clay,

Mixed same as D-48 -
too soft and sticky to take off rolls
added about 75g more clay

T.N. is much softer than
the Peabody (114) stiff shellas -

A 1/6 piece of fiber between platten
and mould to prevent too quick
cooling - made same as D-48

Mould was too hot - stuck
very badly and broke to pieces
in taking off.

break allowed crystals of
X Naphthalene - mica in the clay

Broke D 33 and it did
not show the naphthalene crystals
to the extent that this does but found
some -

D-50 - Material of D-49 and, one
other scrap, printed same as
D-49 except did not have
mould so, hot - did not stick
but material was not quite
soft enough.

D-51

250 g. H.V.P. Fine (Angelos Amber)

75 g. I-Prin

10 g. gas black

665 g. China clay,

Looks more dull than
when mix contains naphthalene

Condensed like leather on
the hot plate - N.G.

D-52

25%	250 g	Shellac H.W.P. Fine -
10%	100 g	Resin -
	10 g	gas black -
	640 g	clay
	1000	—

Came off rolls considerably
softer than D-51

Condensed on steam plate
to rubber stage U.C.

D-53

250 g shellac H.W.P. Fine -

50 g Prim - I grade -

50 g Venice Turpentine -

10 g gas black

640 g clay (Kion)

1000 g

worked about the same as D52
possibly not quite so soft on
rolls

D 54

200 g shellac (HMP, Fine)

130 g Protein

10 g gas black

660 g China clay dried

cut into off rolls about like

D-52

D-55

36% 360 g shellac (H.W.P. Fine) (Kangobitakay)
10 g gas black
630 g china clay.
1000 g total -

Makes a stiff tough composition on
the rolls - seems dry and
crumbles on edges.

1-18 started June 11-18

July 15-18

- *1 No 1 denat Alcohol
- 2 Solocist Naptha - softens, slightly boiling with most & little alcohol added to.
- *3 Turpentine, softens more than 2. The rings will dissolve in it.
- 4 Carbon Tetrachloride
- *5 Benzol
- *6 Camphor Oil - Boiling dissolves it, precipitates on cooling
- 7 Rosin Oil - Boiling in rosin oil has no effect
- *8 China wood oil - Boiling has no effect. Globules of shellac will not ~~be~~ ^{be} absorbed together in china wood oil
- *9 Benzaldehyde Zn, Oil of bitter almonds, Boiling has no effect
- *10 Nitro benzol, Boiling has no effect
- 11 Cedar wood oil. Boiling has no effect
- 12 Eucalyptus oil. Boiling has no effect
- *13 Palmitic acid. dissolved on boiling like lignin
- *14 oil of amber. Boiling makes shellac rubbery and sticky
- 15 Terabene. Shellac is sticky after boiling - solution turbid.
- *16 Dichlor Ethane, Ethylene chloride
- 17 Xylol. Shellac is rubbery after boiling.
- 18 Gasolene, Boiling has no effect
- 19 precipitates like a jelly on cooling
- 14 same effect as phenol

Shellac Liquid solvents

(256)

Put 1g of shellac in a test tube with Measli solvent - on opposite page -

- (1) Alcohol acts much quicker than any other.
- (2) Oil of bitter Almonds (Synthetic) in more than twice the time dissolves about the same as alcohol - waxen settle to bottom that remain suspended in the alcohol.
- (16) Dichlor Ethane - dissolves about the same as alcohol but a little slower than (9) Waxen float on top of the liquid. Separates easily perfectly.
- (3) Turpentine softens shellac very slightly after 12 hours - surface very sticky.
- (5) Benzol softens shellac and it sticks together in a tough rubbery mass after 12 hours - it is not at all sticky.
- (6) Camphor oil - after 12 hours - surface of flakes very soft and sticky but the flakes are still quite brittle.
- (17) Nitro benzol softens shellac like dental rubber, not at all sticky and does not stick together as with Benzol (5)

July 15-18

- 19 Amyl Acetate, softens shellac cold, dissolves on boiling.
*20 Acetone.
21 Toluenol softens cold - no effect on boiling.
22 Kerosene boiling has no effect.
23 Formaldehyde makes like rubber on boiling.
*24 Chloroform.
*25 Amyl alcohol not so good as Ethyl-
*26 Petroleum ether; bleaches shellac on boiling
liquid remaining white
*27 Acetic ether part dissolves, a rotten jelly mass
unaffected after boiling
28 acetic acid softens to a jelly on boiling - bleaching
shellac remains rotten jelly
*29 Bromine water
*30 Ammonia 29% complete solution after long time

26 leaves shellac tough and rubbery but not very soft

(D56 cont)

- (20) Acetone dissolves shellac as quickly as alcohol -
(24) chloroform softens shellac to a jelly in a few minutes,
(27) bleaches - softens to a jelly in a few minutes,
(29) Bromine water - bleaches,
(30) The shellac is made soft like rubber and the liquid turns a rich garnet color the shellac itself is bleached -

Mr. Edison's note -

Hot solvents for shellac -

- ✓ Stearic acid with a little acetanilide to make more fluid. cheap - 30¢ lb
- Monomethylnaphthalene - its a solid shicep
- Phenanthrene — 75¢ lb
- ✓ Trichlorophenol - fairly cheap 12¢ lb
- Monobrom camphor - good solvent liquid 2.2¢
- Quinidine good solvent
- ✓ Benzoylacetol good solvent very Heavy cut -
- ✓ Quinine fine solvent 75¢ lb.
- ✓ Beta naphthol stink - 1.50 lb.
- ✓ also acetanilide 12¢ lb,

Beta Naphthol makes a tough substance like D-57. (2)

Acetanilide

B. Naphthol

Monomethylnaphthalene "solvents" entirely melting - no effect.

Benzoylacetol - makes a very tough material

Beta naphthol + monomethylnaphthalene out.

It takes a ~~very~~ small quantity to make the shellac very soft, a smaller quantity seems to have no effect leaves shellac brittle

Camphor out in 36 hours - gets brittle on surface

Alcohol hydrate - no effect - still brittle -

dimethylnaphthalene benzol - acts like 57 (2)

June 12-18

D-57 - Mr. Edison suggested using Trichlorophenol with shellac to soften it

- ① 5g Trichlorophenol 10g shellac - 33% when cold - soft like rubber packing -
- ② 2g Trichlorophenol 8g shellac 20% when cold about as soft as celluloid, but more brittle.
- ③ 1g Trichlorophenol 9g shellac 10% melting point considerably lowered and when cold is tougher than regular shellac -

Garnet lac acts the same as shellac
33% Trichlorophenol seems just as soft,

Thymol - acts like Trichlorophenol and requires a smaller amt for equivalent result.
Beta Careol, Beta, and para Careol act like

- June 14-18 -

D-58

30%	300 g. shellac H.W.P. (Stiff)
5%	30 g. Tricolour pencil
1%	10 g. gas black
66%	660 g. china clay (Lion-Work Clingtal)
	<hr/> 1000 g.

Very much softer than shellac
alone - a little softer on the hot
plate than the D-39 mixture.
Made a good print but it broke
in taking out of the ring —

D-59-

as D-58-

Same material heated up on
hot plate and moulded again.
stuck to mould and broke
surface shows crystallization
of the Trichlorophenol. just like
the naphthalene. This is "mica" in the clay

D-60

60 g Trichlorophenol
540 g Shellac - HW-164

Melted Trichlorophenol in an iron pan
and gradually added shellac stirring
constantly. Was careful not to
overheat the shellac.

Poured out in china dishes
to cool -

weighed out 330 g of above -

10 g gas black

60 g china clay

1000 g - to give

exactly the same mix as D-58

Too much condensed on steam
plate - made a very dry job and
a poor print.

D-61

243 g. shellac - HWP-164
27 g stearic acid. -
50 g I Rosin -
10 g gas black -
670 g China clay

1000 g. -

Mixt on rolls - leaves the
rolls cleaner than anything else
previously tried

On steam plate - seemed
to condense - so that it was
no use to print -

D-62

250g MW 164 dullac
50g I Rosin
50g Naphthalene
10g gas black
640g Polyma clay (Lion)

1000g

Printed with same type of mould as
Rathie mix. Gb seems too dry — mould
may not have been hot enough.

D-63

similar to 64

Same as D-62 except use
T.N. lac -
very little if any difference
on the rolls - maybe a little
softer. —

same as 63

D-64 250g T.N. lac -
50g I Rosin -
50g Stearic Acid -
10g gas black -
640g China clay - ~~100g~~
1000g total.

Very soft on rolls - leaves
the rolls very clean -
Seems better on rolls than
any previous mixture

D-64 first print had moulds too cold,
2nd print bottom mould was too cold,

||| 2nd print was made of same material
as the first - seemed as soft
on 2nd heating as first.

Skated a third time and was
then softer than others except 65

~~2-65~~ D-65-
same as D-64 except
garnet lac is used instead
of T.N.

Softer and more sticky
than D-64

Printed with moulds like Pathe
first time mould holder was
too small for mould - 2nd time
did not have quite enough
material - both came out
O.K. as far as sticking is concerned

D-66 Varnish Exp -

Reg Varnish 7 min viscosity,
add nearly equal volume of
loose china clay, and a little
alcohol - run thru paint mill
twice -

varnish 1 coat bake regular
varnish 1 coat of reg 7 min visc Varnish
and bake again -

Moulds were injured by
sulphur - apparently from the
clay - also clay fibres split
and caused a number of
very small pull outs -

D-67 250g TN Lac
50g I Rosin
60g Stearic Acid
10g gas plask
630g China clay (Linn)

1000 ~~very soft~~
left rolls very clean

Made a soft gob
apparently as soft as Pathi

Record OK on both sides -

D-68

250g TN fac
60g I Rosin
50g stearic acid
10 gas black
630 g china clay Lion

1000 g -

Specimen not so soft as D-67

Got softer than 67 and
made a better print.
wiped mould with paraffin.
This makes rough on inner
edge of mine as it is all joined
off of the label to the mine
68-2 second print - did
not use stearic acid -

D-69

250 g TNLae
40 g I Protein
70 g Steamic Acid
10 g Gas black
630 g China clay (lions)

1000

very soft - but rotten
crumbs all to pieces on rolls

very soft on steam plate -
makes a shiny job - but
very little difference between this
and 67 and 68

69-1 did not have enough
material to make the job -
|| 69-2 best print made so far
mould was carefully
cleaned and washed with
tanning solution - then cleaned
with alcohol before 69-1

D 70

250g T.N. Lac

80g Resin

30g Stearic Acid

10g gas black

630g China clay (Lion)

Very good consistency on rolls
does not leave rolls quite so
clean as when mix contains
more stearic acid.

D-70-1 best print yet - several
blisters developed in 3 hours.

D-70-2 made on brass back
moulds.

D-71 Same as D-70 except
use garnet lac instead of
T.N.

D-71-1 seems to be about the same
as 70-1

More blisters developed than
in D-70-1

D-71-2 printed on a pair of brass
back moulds - one is very
good - print is ok.
More blisters develop than on D-70

~~250g~~ D-72

250g (164 Shellac)

50g I Norin

50g Tartaric acid

10g Gas black

640g China clay (from bags)

knead hard on rolls and came
off in dry scales -

see D-73

Due to difference in clay

D-73

Same as D-72 except use T N lac
and same as D-64 except that
the old clay in bags in the store
room is used instead of the
iron clay.

This acts exactly like D-72

53-73 inclusive made with
Lin clay which is more like
talc does not contain grit but
in microscope looks like fine
mica. The old clay contains
grit but is very thoroughly disintegrated
and shows few of the mica scales.

D-74 China clay samples - Archiving Dept

- (1) ~~Wm~~ H. Scheel W.D. 2500 letter June 3.
- (2) K+B - No 10
- (3) K+B No 10A
- (4) Kleptin fine white -
(Star washed) lumps - feels smooth
- (5) Bill Cornett Inc.
- * (7) Refined No 1 immaculate Kaolin Co
- (8) K & M Clay Mine Edge Co
- (9) L.C. Clay " " "
- (10) Charles Wagner Snowflake S. Clay
- (11) Drumt Drum P.M.C. not as fine as (9)
- (12) Wm H. Scheel - letter May 28
- (13) Domestic No 3 left, left white Ker
- (14) Golding Burns
- (15) Russell Morris Co 43 Clay
- (16) K+B Terre Blanche
- (17) Lion clay 3 lb
- (18) Notion Stone Crystal - finer than any
- (19) Kincelghur - B. Co of Amer. California
- (20) Old clay bought in bags from Scheel
20 bags as fine as (7) or (9) -
bags brought in one lot by Brach

D-74. Microscope examination of Clay etc.

Micaceous - particles - fine to .001
 " and larger " .001 to .001 mostly above .0002
 " more lumpy. .001 to .003 " above .0002
 grit - mica particles fine to .001 finer than (1)
~~a little finer than~~ to .002 mostly above .0002
 a little finer than (5) with larger lumps,
 a little finer than (4)
 a little coarser than (3) but not so lumpy,
 very fine average, but lumps and mica particles to .002
 coarse mica, fadsticks to .004
 about like (1) but more lumpy.
 very fine average - lumps - particles to .003
 but more coarse particles.
 about like No 1
 coarse grit and mica particles to .003
 very coarse particles to .008
 fine average but lumps of fibers like (12)
 about like (4)
 no large particles all below .0002
 very fine needles - some as long as .006
 not bag about like glau clay (18) and
 both supposed to be the same - these

D 75
wear test

15 times shows no wear
25 times slight wear chip at
side walls -
35 times considerable wear
on side walls - chip out.
Bottom of groove 0.74,
Samuel O. K.

(D 75) 300 g. N. Lac
50 g rosin
50 g stearic acid
10 g gas black
590 g of old clay from 2nd bag

Brady bought this from
W. H. Schell at same time
as the other clay that worked
exactly like Lion clay -

fairly soft on rolls but
not as soft as lion clay
with only 250 g. of lac.

Made up an steam plate
too stiff to ball up well but
made as good a print as
any

D-76 - Materials obtained in W. 7.

- ① Keystone Minerals Co. A-X Rotten stone air floated 30⁰⁰
- ② " " " Rotten stone dust - 35⁰⁰
- ③ " " " X10 Mineral Black - 30⁰⁰
- ④ King & Malone Co. Rotten stone - 3¢
- ⑤ " " " "Maleo" FFFF 2¢
- ⑥ " " " "Material 8/1 Deluminite.
- ⑦ Franco Amer Chem. Co. Rotten Stone Air floated \$10⁰⁰
- ⑧ " " " " " 10/1 Filler - \$15⁷⁵
- ⑨ K.F. Coriiffiths & Co. Rotten stone not air floated. \$20⁰⁰
- ⑩ Industrial Chem. Co. Special Whiting (25⁰⁰)
- ⑪ " " " Extra light Chalk 4 1/4¢ ①
- ⑫ " " " " " 4 1/4¢ ②
- ⑬ " " " " " Tyronex ③
- ⑭ " " " V. G. Black (6¢)
- ⑮ " " " Regular chalk -
- ⑯ Franco Amer Chem. Co. Black Filler - 14⁰⁰
- ⑰ Wm H. Schule A.F. Filler 3¢ Aluminum "Flake"
- ⑱ " " " Barrytes (25⁰⁰)
- ⑳ " " " Superficial Earth 3 1/2¢
- ㉑ Chas B Almytal Rotten Stone.

D77 Materials obtained in N.Y.

- (1) W. J. Line Co. - Fluores White Seal 14% L.C.
- (2) " " " " Green " 13 1/4
- (3) " " " Standard 5% Phos Rb 8 1/4 10 1/4
- (4) " " " Schlegel 35% " " 9 1/4
- (5) " " " Standard 4% Hydrogene 8 d
- (6) Siemens & Halske Precip Barium Sulfate 4 d
- (7) Krebs Reagent & Chem. Co. " 1 1/4 L.C.
- (8) Clunefield Products Corp. Barium Carbonate 65.00 ton
- (9) " " " Blanc Fine 80.00
- (10) National Eniline & Chem. Co. Precip chalk 5 1/4 d ~~11 1/4~~
- (11) " " " Magnesia Carbonate 11 d ~~10~~
- (12) " " " Barium Carbonate
- (13) " " " " Sulfate XX
- (14) " " " " " XXX
- (15) International Pulp Co. Magnesium Silicate Supergrade 2 d
- (16) " " " Tale AAI Grade 2 d
- (17) L.H. Portland Co. Magnesia Oxide 1 1/2 c
- (18) " " " Light " " 40 d
- (19) " " " Pl. Silicate 2 d
- (20) ~~W. J. Line Co.~~ Minute Fuller Earth 10.00 ton -

278

Materials obtained in New York -

- (1) Union Tale Co. 2¢ lb.
- (2) Talk Products Co. \$900 ton - 18¢ nominal price
- (3) J. W. Coulston R. Burnt Umber 5¢ from Cypress Island
- (4) " Capital Band Colored Magnesia 7¢
- (5) " 3 II Not Barytes 2¢
- (6) " 1 Golden Ochre 6¢ Terra Alba Clay (Champh)
- (7) " A Hatch Pink 11¢ Barytes or Terra Alba - 50¢
- (8) " X 95 Red 22¢ Barytes base -
- (9) " B Drop Black 7¢ Coarse -
- (10) " A Drop Black 8¢ Coarse -
- (11) " Dry Blane Fire 5¢ VV, fine
- (12) " C Burnt Umber 5¢: UV, fine like (3)
- (13) " BX Ochre 4¢ W. fine from Pa.
- (14) " Aluminum Hydrate 16¢ VV, fine - but lumps.
- (15) Dunn & House Rotten Stone 2 1/2¢
- (16) Residual from extraction of Victor.
- (17) Same Residual after roasting -
- (18) Keystone Minerals Co. A-X Rotten Stone.
- (19) Clinohedral Products Blane Fire.
- (20) Blane Fire from 25 lb lot.

all crystals - H.C. fine to .006
not quite as much fine as (1)
VV, fine like smoke rotten stone
has a little like precip. chalk, not as fine as (1)
fine but has crystals -

contains manganese oxide - used as blue also (3)

Materials obtained in New York

- (1) E.M. & F. Waldo Blue Fire G4554 $5\frac{1}{2}\%$ SSD
- (2) " " "Basofa" $5\frac{1}{2}\%$ C
- (3) Marden, Orth & Hastings Blue Fire $5\frac{1}{2}\%$ C bot 4 g
- (4) " " "Green and diproduct (1000) 7000 -
- (5) Gabriel & Schall Dry Blue Fire $4\frac{1}{4}\%$ C
- (6) " " Lithopane $8\frac{1}{2}\%$ C
- (7) " " Barium Carbonate $\$40.00$
- (8) " " Barites $\$35.00$
- (9) Whitaker Clark Daniels Eng. loaded clay. $\$34$ $\$65.00$
- (10) Plate flow $\$2.25$ - $\$17.50$ New England
- (11) Terra Alba no 56 $\$22.50$ from ~~the same~~
- (12) Kieselglum no 211 $\$40.00$
- (13) Talc no 4 $\$37.50$
- (14) Hammill & Collespie Better Stone $4\frac{1}{2}\%$ to 5%
- (15) " " Welsh Terra Alba $1\frac{1}{2}\%$ in bags
- (16) " " M.D.C. Talc 2%
- (17) " " Lee Moor Clay $2\frac{1}{4}\%$ C
- (18) " " Silica 2%
- (19) Celite B.H.
- (20) T.B. King. Muntworth Terra Alba, Nova Scotia $\$24.00$ Port au

V.V. fine
 V.V. fine but less flake crystals
 V.V. fine " "
 full of lumps of "suppline".
 V.V. fine a few flake crystals.
 V.V. fine a few small flake crystals.
 V.V. fine
 Coarse crystals
 All mica
 finer than (9) but all mica
 V.V. fine but some clay flakes
 looks like 11 but not as fine
 crystals .006-.008
 about as fine as AX but not uniform.
 Coarse "magnesian arkstone"
 U.C. coarse crystals .008
 plates of mica .006
 fine - small flake crystals
 clay crystals and apophyllite spines.
 Coarse crystals -

D-80.

4%			
20.83%	3250	g	Garnet Lac
4.16%	50	g	I Krim
4.16%	50	g	Sulfuric Acid
.83%	10	g	Gas H ₂ O ₂
70.	840	g	AX. Rotten Stone -
100%	1200	g	-

Cooled too long on rolls -

781

.15%	210g	Garnet Lac
.02857	40	I Rosin
.02857	40	Marie Aid
.00714	10	Gas Black
7857	100	Lithopane (Pavlovite)
109.6	1400	

D82

300 g garnet lac.

20

I Prodn.

20

Stearic Acid.

10

gas black.

650

AlX Mother Stone.

Toostiff on hot plate

D83

250 g garnet lps

20 g I Posm

40 g Stearic acid

100 g gas black

810 g rosin stone -

~~1100 total~~
started with 650 rosin stone
but had to add 160 g more
rosin stone to get it off
the rolls.

Softer than than D82 -

Entirely too stiff on hot plate

D84

250 g	garnet Lac
17 g	I Noim
35 g	stearic Acid
688 g	XX Notundston
<hr/>	
10 g	gas bleach
1000 g	total —

like D-83 on rolls

Worked much softer
on steam plate I probably
due to taking a shorter
time on rolls —

200 CC AX Bottom Stone jolted down
solid from 200 CC loose

weighs 182 g.
125 CC water may be added
without increasing its volume
100 CC added slowly and
well mixed reduces volume to
175 CC

125 CC "Pondlith" weighs 150 g

300 g pondlith will fill the pores
in 350 g rotten stone.

D85

230 g garnet lac
150 g I Prim
30 g Stairic Acid
10 g gas black-
325 g Lithopone Pondlith
390 g AX Bottom Stone
1000 g total,

too Stiff on steam plate
Should be made up richer and
with rolls not
so hot and then it
could be removed
so that it will
be very soft on
steam plate

glass jar (273g)

D-56 Varnish Exp. -

268g regular varnish -

268g Lithopane -

Run thru small paint mill
very small amt of alcohol added
in paint mill to about replace
evaporation -

86-A - one coat reg then 1 coat above

86-B - one coat of above then one coat reg

86-C - two coats of above

Painted 7/5/18

All good surface -

SOFT

D-87

Same proportion as 85 except
that the stearic acid and resin is
more ~~the~~ in proportion to the lac

190g - Carnet Lac

40g - Resin

45g Stearic acid

18g Gas black

32g Lithopone

390g Rotten Stone

1000g total.

Soft on rolls -
~~Softest~~ put on steam plate
flashed out on mould
until no fire was left
around the edge -

Put Lithopone in first then
Rotten Stone -

D-88

185 Garmet Lac
39 Rosin
44 Stearic Acid
10 Gas black
328 Lithopane
394 Rotten Stone - AX

Double amt made up 2000g.

Lac - Rosin - Stearic Acid melted
on rolls with Gas black -
Lithopane mixed in well and
then Rotten Stone added -
Very soft on rolls -
had to turn on water to get it off

worked fine on hot plate and
made a record apparently
as good as the Phastern mould
is capable of making.

D-89

190 Gramet Lac.

35 Porin.

40 Alcanic Acid.

* 20 Gas black.

320 Lithopone.

390 Rotten Stone. AX

double amt made up
not quite so soft and rolls
as D88 -

See also D99

D-90 -

350 g - ~~XXXX~~ ^{H.W. Peabody & Co. shellac 44 lb.} ~~XXXX~~ ^{NO 3} ~~XXXX~~ ^{had 1096}
10 g - gas black -
640 g - Ax. Poststone -

Very tough on rolls -
sticks to both rolls very badly.

Prints as good as 88 or 87
tho it is a little stiffer on
the steam plate II

See also D-100

D91

Same as D90 except are
"smoke" rollstone -
very stiff and dry on the
rolls -

could not mould

D-93 Varnish Experiment,

glass jar weighs 2739 grammes.
345g regular varnish 5miniscuity.

345g "Penolith"

Put ~~thin~~ small paint mill
added about 50 cc 100 Denat Alcohol

Put on one coat very heavy then
second coat regular varnish.

Sounded good but not
much better than regular

D-94

Materials obtained in New York.

- (1) C.P.N. Chemical Co. Inc. *1 Plane Fine
- (2) " " " *2 Paris White
- (3) " " " *3 Gilders Whiting
- (4) " " " *4 Gilders Whiting
- (5) " " " *5 Sublimed White Ash
- (6) " " " *6 Clay coarse
- (7) " " " *7 Clay fine
- (8) Innes Sweden China Clay No. 11 all mica
- (9) " " Clay No. 2 fine but has mica
- (10) Thomas C. Dunham - Whiting fine
- (11) Furst Bros Earth - E 8181. Mica and
- (12) C.T. Osborn Co. No. 1 Chalk 2000 Potter -
- (13) " " " "S" Precipitated Chalk 50
- (14) Clondyfield Products Plane Fine V.V. fine
- (15) 25 lb purchase - Plane Fine.
- (16) 25 lb purchase Barium carbonate -
- (17) N.J. Zinc Fluorescent White Seal Zinc Oxide

see letter file 49

how to

looks like Tale -

plates .003

has some grit.

crystals -

Mica - grit etc.

very fine -

free from grit -

has lumps and crystals and flakes -

V. fine -

V.V. fine but has specks & lumps

D96

330 g ^{XKPP} soft flowing shales
20 stearic acid —
10 gas black —
640 ~~As~~ X rotten stone —

Worked OK. on rolls but
kept it on a little too long
Started to condense on
steam plate - too stiff
to make a full print.

D96

360 g. soft flowing shellac ^{KKPP} -
30 g tartaric acid -
10 " gas blacks -
600 " smoke rotten stone -

worked off on rolls -
printed on new moulds
quietest surface yet - got
was a little too stiff but
made a good print

D-97 - varnish Exp.

300 g. regular varnish-

200 g. Florence White Seal Zinc Oxide

Ground twice thru paint mill
added about 50 cc ducat alcohol

Sounds about the same as
the regular varnish.

D-98

Varnish Exp.

288 g. Reg Varnish

288 g. Clinchfield Blanc Fixe.

Run thru paint mill twice
added about 50 cc alcohol

Made a beautiful paint for
~~brushing on walls etc. in~~
~~the paint shop.~~

Nearly all ~~the~~ poor prints.
Two samples out of 8 are OK.
and sound a little smoother
than the regular.

D-99 - Same material as D-89

Made a beautiful print
but bubbles swelled up in it
from trapped air.

Same material as 88
gave same results -

D-100 Same material as
D-90 - Made a fine print -
used the material that squeezed
out from D-90 to get enough -
big good consistency on heating

Made two more prints both cracked
in mould - These are the only
prints I have had to crack -

Barium oxide is a poison

" Carbonate "

" Chloride "

Barium Sulphate not a poison

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Phonograph Record Experiments -- W. W. Dinwiddie Disc Books
Notebook, N-18-08-14**

This notebook was used by William W. Dinwiddie during August-December 1918 for notes on the production of disc record blanks. Edison's supervision of this work is indicated by Dinwiddie's references to his suggestions and his comments that Edison personally tested some of the materials. The experiments are numbered from D101 through D197. The entries indicate differing methods of preparation involving variations in the baking schedules and methods of applying the varnish and the use of different ingredients, combinations of ingredients, and varnishes. There are also illustrations of various ways to set up the presses and molds. Most entries contain comments about the results of the experiments, including whether the disc was too soft, sticky, or stiff and whether it had swell-ups, warps, or cracks. Also included is a description of an experiment "to determine what metals are most liable or less liable to stick to blanks when used as moulds." There are occasional lists of chemicals and other materials ("materials obtained in N.Y."), along with notations regarding their characteristics, sources of supply, and prices. Inserted into the book is a 2-page memorandum from Dinwiddie regarding the procurement of stearic acid in New York City, along with Edison's response. The notes indicate that Charles T. Dally and Ludwig F. (Louis) Ott were working on related experiments. The front cover is labeled "Dinwiddie D-101 — 200/++/." The pages are unnumbered. Approximately 110 pages have been used.

Gears and Winding Machine

gear hole	pitch	16 teeth	pitch dia	blank dia
$1\frac{1}{4}$ 1 3/4	6	16 teeth	2.666	
$1\frac{1}{4}$ 1 3/4	6	65 teeth	10.833	

D101 Materials obtained in New York ¹⁸⁹²⁻¹⁹⁰²

- (1) Ground Bottom Stone T. Van Duzend & Son.
- (2) Finely powdered Earth - Fucro & Bros. & Co.
- (3) 400 H.S. Silica - J. Lee Smith & Co. 9000
- (4) "Clay for" Natural Earth 4000
- (5) C.P. N. Chem. Co. No 9 ^{Polysilicate} like Calc.
- (6) " " " No 10 ?
- (7) " " " No 11 Contains large Crystals
- (8) corn starch very uniform staining
- (9) M. Ewing Fox Company, Inc. Clay 4000
- (10) " " " Paris White 4000
- (11) " " " Magnesium Silicate 5000
- (12) J. Lee Smith W.F. 400 Silica cheaper than (3)
- (13) Geo. W. Crook E. & W. Whiting (Paris White) 81, 83 cont.
- (14) Kieselglum Co of America - California Kies
- (15) W. L. Latham Clark & Daniels Kiesglum -
- (16) Calcium Carbonate S.T. Air floated Induct
- (17) Calcium Carbonate No 5 - Ground limestone
- (18) " " No 6 Ground lime stone
- (19) Toth Bros "Colloidal" Polysilicate
- (20) Still house D.C. Filler
- (21) " " 3 bear filler

apparently not air floated -
 perhaps, 86, 3 + (residual silica?)
 Abrasive like carborundum -
 clay crystals, 804
 and Magnesia -
 finer than (5)
 and metal ~~globules~~
 globules -
 No grit - few flakes -
 V. fine
 like Kiesglum - Very fibrous -
 full of grit,
 but not as fibrous as (11)
 granular
 chem. Co. as good as precip. chalk -
 H. G. Crystals
 H. G. Crystals

D-102

250 g shellac XXPP NO3

10 g gas black.

740 g blanc fixe.

1000 total

Buy soft and sticky
on rolls —

D-103. Varnish experiment—
Bentonite in alcohol enough
to cover after standing all night.
2 plates put on and baked
regular way.

D-104 Materials obtained in New York.

- (1) Imperial Color Works, Glass Falls, N.Y.
- (2) Simon & Kling Alumina Hydrate.
- (3) " " Barium Sulphate 9109
- (4) " " Tereba Alba No 1
- (5) L. H. Bristol Superwhite - Calcium Carbonate \$25.00
- (6) John C. Ward & Co. Infusorial Earth
- (7) " " " Plane Fire
- (8) " " " China Clay
- (9) " " " Fullers Earth
- (10) " " " Precipitated chalk
- (11) " " " Tripoli very coarse Quartz
- (12) " " " Silica " " "
- (13) " " " Whiting precip. chalk - hydrous
- (14) Harsco Fuller & Co. Inc. 177, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 445, 447, 449, 451, 453, 455, 457, 459, 461, 463, 465, 467, 469, 471, 473, 475, 477, 479, 481, 483, 485, 487, 489, 491, 493, 495, 497, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 567, 569, 571, 573, 575, 577, 579, 581, 583, 585, 587, 589, 591, 593, 595, 597, 599, 601, 603, 605, 607, 609, 611, 613, 615, 617, 619, 621, 623, 625, 627, 629, 631, 633, 635, 637, 639, 641, 643, 645, 647, 649, 651, 653, 655, 657, 659, 661, 663, 665, 667, 669, 671, 673, 675, 677, 679, 681, 683, 685, 687, 689, 691, 693, 695, 697, 699, 701, 703, 705, 707, 709, 711, 713, 715, 717, 719, 721, 723, 725, 727, 729, 731, 733, 735, 737, 739, 741, 743, 745, 747, 749, 751, 753, 755, 757, 759, 761, 763, 765, 767, 769, 771, 773, 775, 777, 779, 781, 783, 785, 787, 789, 791, 793, 795, 797, 799, 801, 803, 805, 807, 809, 811, 813, 815, 817, 819, 821, 823, 825, 827, 829, 831, 833, 835, 837, 839, 841, 843, 845, 847, 849, 851, 853, 855, 857, 859, 861, 863, 865, 867, 869, 871, 873, 875, 877, 879, 881, 883, 885, 887, 889, 891, 893, 895, 897, 899, 901, 903, 905, 907, 909, 911, 913, 915, 917, 919, 921, 923, 925, 927, 929, 931, 933, 935, 937, 939, 941, 943, 945, 947, 949, 951, 953, 955, 957, 959, 961, 963, 965, 967, 969, 971, 973, 975, 977, 979, 981, 983, 985, 987, 989, 991, 993, 995, 997, 999
- (15) " " " Dupont "
- (16)
- (17)
- (18)
- (19)
- (20)

Alumina Hydrate.

Marble dust -

large mica crystals -
looks like clay has mica crystals -

2 1/2 % not in float -
3 % " " " clay crystals -

Dally's Mix No - 70.

1200g. Rosin melted } ^(10 turns)
 238g. Cotton flax } per gal
 3000g. Chalk - } super

Flax first in mixer -
 then all melted rosin -
 then add $\frac{1}{2}$ of chalk at a time
 until all is in and mix for
 $\frac{1}{2}$ hour longer -
 too much for mixer

960g Rosin - } 8 die
 230g cotton - } batch
 2400 Chalk - }

Plaster made with chalk double up
 in setting - Mr. G. suggests using
 more sand and lower temp. in baking

D-105-

Coob of clay - rosin - flax - straw oil
 and Solvent Naphtha - Dally's mix No 40-41
 pressed in hydraulic press between two
 pieces of paper.

Too much rosin in mix relative
 to Solvent naphtha makes it stick.
 Solvent naphtha on the paper helps.

115 cc Solvent Naphtha
 10 grams straw oil
 100g rosin
 29g flax
 30g clay
 554g total

silk }
 linen }
 feather } worse than paper
 brass wire mesh } best.

D-106-

Aug 14-18

Put regular varnished blanks in vacuum drier heated to 120° - could not detect any softening with finger nail, heated to 130° - seemed to scratch a little easier but very little.

Heated to 140° - easier to scratch, but direct pressure with finger nail did not leave a mark.

Heated to 150° - direct pressure with finger nail makes a slight dent in the varnish.

This vacuum drier will not get hot enough for varnish blanks baking.

D-107

Aug 21 - Aug 23-18

Hydraulic press platten heated
with hot water circulation
Thermometer in tank.

Platten at 55°Cent - 131°F

no sign of sticking to mould - only
525 lbs pressure an accumulation - not
sufficient, see last page this book

Platten at 60°C - 140°F blanks
stick to mould -

Platten at 57°C do not stick so that
pull outs are curved,

D108

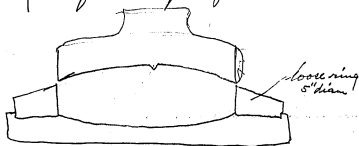
Aug 24-1918

Hydraulic press operated from
accumulator 700 lbs pressure.
Platins heated by hot water
circulation $57^{\circ}\text{C} = 134\frac{3}{4}^{\circ}\text{F}$.
Platins heated in oven laid flat
on a transfer plate for 40 min.
(^{got} ~~Platins~~ stood on edge in the oven
always are softer on one side than
the other even after 6 hours.)

~~Platins~~ heated on steam plate
covered with pasteboard are OK
but got must be hot

used Dally's mix No 70 See page ~~108~~
opposite 108

D109
Mouldfi Press for gob —



Center pin in plunger on
arbor press - leaves a center
mark on gob to center the
gob in hydraulic press.

D-110

see D117 etc

Dulley, No 70 = { 960 Pecan = 26.6% } No 79 is
 { 230 Cottonwood = 6.5% } same as this
 { 2400 Chalk = 66.9% } except clay for
 total 100.0 chalk

D-110 { 1000 g Pecan = 25%
 240 g Cotton = 6%
 2760 g Chalk = 69%

D III

125g Bozin

80g Cotton flax

345 + 90 = 435g AX Cotton stone -

- Mix is a little too dry -

Too dry and stiff to make
a good blank - 00

D112

125g Rosin

30g Cotton flax

380g Br rotten Stone

A little too stiff
not quite enough material
to make a blank

See D133

D 113

125 g Rosin 25%
30 g Cotton Floss 6%
345 g AX Rotten Stone 69%

7 times
for
3 gal
7 times

{ 875 g Rosin
210 g Cotton
2415 g AX Rotten Stone

8 times

1000 g Rosin
240 g Cotton
2760 AX

Mr. Edison tested following materials for iron -
his notes as follows

Chalk. not much iron

Magnesia Silica Very little iron. HCl decomposes some
and free silica precipitated.

China clay very little iron.

Lion clay no iron OK.

Broken Stone Awful % iron H.C.

Lithopone no iron acid decomposes it some
giving precipitate soluble in KOH & also
ammonia.

D114

125g

Rosin.

(19%)
(14%)

30g

Cotton

345 + 135 = 483g Blanc Fixe

Not quite enough to make a
full blanc - Sun OK.

See 132

D115-

125 g Resin
80 g Cotton flax
265 g 400 mesh Silica

tied 345 g Silica twice and
made very chunky mix -

D-116

One quart regular 1841-E Varnish -
{ varnish contains about 3.75 g/para
236 cc contains .94 g "
add 2.82 g "

Rellyph 77 236 cc contains 7.56 g 6/4
add 2.06 g 6/4

Bake on schedule $\frac{1}{2}$ hour 110° F
 $\frac{1}{2}$ hour 120°
 $\frac{1}{2}$ hour 140°
1 hour 150°
hold at 150° for 5 hours,
blanks warped very bad -

~~XX~~ 2 Schedule - $\frac{1}{2}$ hour at 110° F
 $\frac{1}{2}$ hour at 120°
 $\frac{1}{2}$ hour at 130°
1 hour at 140°
hold at 140° for 7 hours

D-117 1000g Rocin 25%
 2800g Cotton 7%
 2720 chalk 68%

 4000g total

D118 1000 g Protein 25%
320 g Cotton 8%
2680 g chalk 67%
4000

D119

1000 g	Resin	25%
360 g	Cotton	9%
2640 g	Chalk	66%
<u>4000 g</u>		

D120 1000 g Krim 25%
 400 g Cotton 10%
 2600 g chalk 65%

 4000 g

too dry - birds not true and
 was too skinny to stick together
 in go - too difficult to pick out
 in press - see 122

D-121	1080 g.	Protein	27%
	400 g.	Cotton	10%
	2520 g.	Chalk	63%
	4000 g.		100%

better than 121 but
too dry.

D-122	1200 g	Roan	30%
	400 g	Cotton	10%
	2400 g	Chalk	60%
	<u>4000 g</u>		<u>100%</u>

BK.

This was the only one perfectly flat in a lot of 20 packed in even after ramming. (118-126 inc) two more of this number - the other one was slightly warped.

D-123- Rosin	1280	32%
Cotton	480	12%
Chalk	2240	56%
	<u>4000</u>	100%

OK on mixing -

D124

Resin	1400	35%
Cotton	600	15%
Chalk	2000	50%
	<u>4000</u>	<u>100</u>

Good but more resin than needed

Ref 12-18

D12.5

Proim	1320	33%
Cotton	600	15%
Chalk	<u>2050</u>	<u>52%</u>
	4000	100

OK, on mixing & blending OK

Accumulator weight increased by
old patterns Sept 13-19

D-126

Prim	1080	27%
Bottom	320	8%
Chalk	<u>2600</u>	<u>65%</u>
total	4000	100%

OK on mixing - 6-1-19

D127

126 Blank-
circulating water in press 47°
Oven 145°
Hydraulic pressure 925°
Does not stick.

D128

118. Blank
Circulating water in press 55°
Oven 145°
Hydraulic pressure 925°
Does not stick.

D129

Blank with two pencil marks on edge $\frac{1}{8}$ inch from face

line appears on blank badly broken
average distance about 1" from edge
 $1\frac{1}{8}$ to over the edge

D130

Blank with pencil circle on each face $\frac{1}{8}$ inch from edge

same as 129 but average 2" from edge
 $\frac{1}{2}$ to $2\frac{1}{2}$ from edge

D131 Rosin 960g 24%
Cotton 320g 8%
Chalk 2720g 68%
4000 100
works good

(See 114)

D-132 140 g Rosin 20%
35 g Cotton 5%
525 g Blaine Fixe 75%

700

Made a good consistency gob,
put the gob on steam plate at
10⁴² AM. Sept 26 - 18
taken off - OCT 4 - 18 turned brown
same proportions by more (1% = 9)
180 g Rosin
45 g Cotton
675 g Blaine Fixe.

900

~~1260~~ 1260 ^{Return}
315 Cotton
4725 Blaine Fixe

6300

Moulds best at 118°F 122°F sticks
to moulds -
varnished and baked printed on regular
schedule in flask moulds at 23 sticks
all over mould. See page opposite 165

(see D113)

D-133

175 g	Protein	25%
42 g	Cotton floe	6%
483 g	magnum white	69%

too dry will not make a gel.

D-134

210	Perim	30%
42	Cotton Flac	5%
448	Magnesium Silicate	64%

700 total

Makes a good looking gold

1260 Perim

252 Cotton flac

2688 Magnesium Silicate

4200 total

Warps in oven at 130°
Shows a lot of "swell-ups"

D-135

See 138

175 Prin 25%

42 Flac 6%

483 Plastic film 69%

7.00

too dry

(138) is too soft to handle
got put in press in a
ball

D-136

204 g Rosin
6 cc ~~Stear~~ oil } 30%
42 g Cotton flac. 6%
448 gr Magnesium Silicate 64

1224 g Rosin
36 cc Stear Oil
252 g Cotton flac.
2688 g Magnesium Silicate

Q-137

21d/3000

3074

42. *C. h. h.*

62

218	1/2	Iron	35%
42		Cotton	6%
448	400	Thick fabric	64%

40

very soft too soft
to handle gob - put it
in press in a ball -
stretch to top - broke

D-138

210	Prose	30%
42	Gottow	6%
448	Partiparis	64%

~~too soft~~ to bundle
~~got~~ put in the press
in a ball

Blank varnished and baked at 130°F
crumpled up - entirely too soft.

(134)

D-139

224 Porim 32%

42 Cotton 6%

434 Magnesium Silicate 62%

700

1344 Porim

252 Cotton

2604 Magnesium Silicate

14200

D-140

231 Protein 33%

42 Cotton 6%

427 Magnesium Silicate 61%

700

100%

1386 Protein

252 Cotton

2562 Magnesium Silicate

4200

did not make this -

D-141

238	Proim	34%
42	Cotton	6%
420	Magnesium Silicate	60%
<hr/>		
700		

1428	Proim
252	Cotton
2520	Magnesium Silicate
<hr/>	
4200	

Makes a gob too soft to handle -
varnished blank baked at 130°F crumpled
up / very much too soft

D-142

{ 1176 Protein 48%
452 Cotton 6%
2772 Magnesium Silicate 66%

Dulley No 98 1320 Noim 33.4 %
 230 Fib 5.8
 old clay mud. 2400 clay 60.8
 3450 too dry.

Dulley No 99 1420 Noim 35%
 230 Fib 6%
 old clay mud. 2400 clay .59%
 4050 dry enough.

D143

	large size	small size	
Posin	1428	238	34%
East Cotton	252	42	6%
Lion Clay	2520	420	60%
	4200	700	100%

Makes a very much softer goob than
 the ~~old~~ old clay.

D144	large mix	small mix	
Roam	1470	245	35%
Dust Bottom	252	42	6%
Lion Clay	2478	413	59%
	<u>4200</u>	<u>700</u>	<u>100%</u>

With Lion clay the ash is
entirely too soft to handle - it
runs out to double diameter
in the oven and gets run
together.

D145	Large rim	Small Rise	
Flour	1512	252 1000	36%
Quint cotton.	252	42 1000	6%
Lion Clay.	$\frac{2436}{4200}$	$\frac{406.8}{700}$	38%

not made with Lion Clay
too soft

D146	large mix	small mix	
protein	1554	259	37%
ant cotton	252	42	6%
high clay	<u>2394</u>	<u>399</u>	57%
	4200	700	

with the old clay this
is about the maximum
amount of gain that
can be expected. It is a
little more stuff than #147
made with Lion clay.

D 147

210 Noim 30%

42 Cotton 6%

448 ~~xxxxxxxxxxxx~~ Lion clay 64%

700 Total -

1260 Noim

252 Cotton

2688 Lion clay

4200 Total -

147 Made with Lion clay
is softer than 146 made
with the old clay from Schuch

D148

210	Rooin	30 %
70	Cotton	10 %
280	Magnesium Silicate	40 %
140	Blanc Fixe	20 %
<u>700</u>		<u>100</u>

1260 Rooin
420 Cotton
1680 Magnesium Silicate
840 Blanc Fixe
4200 total,

This blank made with circulating water at 110° F has a decided tendency to stick in the mould - but it makes a proportionately perfect fill. Makes a good stiff gob.

For the stiffness of the gob it makes the best picket of anything tried, even better than #32

D-149

Experiment to determine what metals
are most liable, or less liable to stick to
blanks when used as moulds,
Sheet of each metal laid in mould in
hydraulic press - paper laid on top of gold
to keep from sticking to other half of ~~the~~
mould, (left on blank to cool.

Brass		* no apparent tendency to stick
Copper		Hard rubber seemed nearer
Zinc	*	to sticking than any of the
Nickel		metals, but none were
Aluminum	*	stuck at all like the blank
Lead		sticks in the press,
Tin plate	*	the plates were not in perfect
Iron oxidized		contact and not quite so
Hard rubber		lost as the mould, also

when plates are left on the blank to cool
conditions are quite different from the mould
in the press even when cooled with water.
plates and blank shrink apart without
pull out. Above tried with D134 mix and
temperature of water in press 160° F.

With steam on the platino Zinc, Aluminum
and tin plate stuck fast, and remained stuck
for 4 days. Oct 18-1918 - Removed after hammering with
wood block. No appreciable pull out, but tears in
all time. (93)

D-150

Weigh out 3 lots of cotton 500 each.
Weigh out 1000 Resin

Prepare ~~500 more~~ 500 more Resin

Weigh out 4 lots chalk 500 each.

500 cotton	} at 10.10	Resin 1500.00
500 chalk		Cotton 700.00
1000 Resin		Chalk 1500.00
		3700

500 chalk at 10.20

200 cotton at 10.30

500 chalk at 10.20 looks granular

500 Resin - 10.45

Resin OK
Chalk OK

at 11.20 500 gr. make into flake

D-150

Resin	1500	40.5%
Cotton	700	17%
Chalk	1500	40.5%
	3700	

Coldest cotton much Resin after mixing
 began gradually softening until
 softening was right to make a job.

Blank washed D-150-A
 was washed out of the tank
 that evening

Washed with two coats of reg. varnish
 except that 3% of fine varnish added.

Baked
 1 hr to 110°
 1 hr to 120°
 3 hrs to 140°
 6 hr at 140°

remained flat -

D-151

Resin,	1500	40%
Cotton,	750	20%
Chalk,	1500 1500	40%
	3750	

124 in) 400 cotton
1000 Chalk - lost
1500 Resin

add only 250 cotton after mixed the 1st.
then add 500 chalk a little at
a time,

Varnished and baked regular did
not bend or warp appreciably.

Printed regular - full print but
resin stretched out from the Varnish
all over inside N.C.T. Toomuch
Resin,
Examine 2004 - fine cracks all over.

See 125

0152

Roam	30%	210 gals.	21
Gltn	30%	210 gals.	
Chalk	40%	280 gals.	
		<u>700</u>	

Time on rolls -

too dry - crumpled on rolls.
tried to make blank but too
dry and crumbly.

D-153

Flour	40 %	320 g-
Cotton	30 %	240
Chalk	30 %	<u>240</u>
		800

Mix on rolls -

Made a crumbly mix - put in
press with steam on platters, made
a very shiny blank but stuck
slightly. Needs more chalk. See D156
and also D152

D-154

Water (1700 cc)
Starch 300 g 18%
Cotton 400 g 16%
Chalk 1800 72%

Added chalk and cotton gradually
gave a beautiful smooth mix in one hour.
but too wet. ran mixer 3 hours more to
dry it out. used solvent naptha
on moulds to prevent sticking.

Blankets curl up when dried flat
on pieces of cardboard.

Composition is porous and fairly
strong, probably not plastic under heat
of printing press.

D-155

217 g glue
1100 cc water
400 g cotton
1000 g chalk —
start 7:30 am Oct 10.

all glue }
all cotton }
3/4 chalk }

200 cc water added as mix was all in
fine balls about 1/8 diam.

580 g chalk added 1:30 pm

no growth - could not make
a blank - not enough glue & chalk together

glue soaked in water
over night and
warmed up till
dissolved —

D-156

Roan	35%	280
Cotton	25%	200
Chalk	40%	<u>320</u>
		800

Mixed on rolls -
crumming but makes
a solid 98%,
Baked regular bake in
24 Building - very slightly warped

D 157

~~Poppy~~ 2800
~~Poppy~~

2000 g Alum crystals melted and
dissolved with it was tough sticky
mass when cold. crust ^{off} bottom of pan
entirely deliquesced.

put in large mixer with 500 g chalk
and 200 g cotton. Stalled the
machine before completely mixed. made
imperfect blank. stuck to cold mould.
N. G.

D158

Mountain Wax	210	30%
Cotton	135	15%
Chalk	385	55%

took a very long time to mix
and there was in small balls,
but struck together OK in
blanks.

D-159

Rosin	140	20%
Manilla Copal	140	20%
Cotton	112	15%
Chalk	308	44%

Rosin	840	In ten minutes all
Manilla	840	cotton and chalk in-
Cotton	672	ten minutes more and
Chalk,	1848	mixture seems complete.
	<u>4200</u>	Pulls out in string
		more than any other mixture used.

Moulded best with press platten water
at 155°F
Varnished and baked regular - fell down
and crumpled up completely.

D-160

Tronin	15%	630 g
Merck Copal	15%	630
dust Cotton	6%	252
Chalk	64%	2688

Circulating water in press platform 158°F

Warmed and baked regular
warped about 1" out of plane

D-161

Rosin 10%	70g
Manila 10%	70g
Cotton 10%	70g
Chalk 70%	490g
	<hr/> 700g

Mixed on rolls - did not have the rolls at high enough temperature to press out into a blank. Mixed very easily,

D 162

Rooin	12%	84 g	
Maile	12%	84 g	
Cotton	10%	70 g	
Chalk	66%	462 g	420
		<u>700 g</u>	

42g chalk left over 6% could not
get in all - too dry

D163
 Iron 7% 49g
 Manganese 21% 147g
 Carbon 18% 70
 Chalk 62% (434) 300

90 g chalk would not go
 in - 7 more sand combined
 gets as stiff as sand to work.

D 164

Kosin 12%	91
Manila 13%	91
Colony 14%	42
Chalk 15%	(25) 466

put in all but 1/2 of chalk -

mined and laid regular
warped 3/8 out of plane

two old level rings one left in original form and the other faced off all except a very narrow ridge at inside edge to cut off:



mould
copper rings to raise holder rings.
Mould

both prints smooth surface
cracks marked by parallel line on records -

D-165 see also 163

Titan	8%	56g
Manila	22%	154g
Cotton	8%	56g
Chalk	62%	434g
		<u>700g</u>

Worked good - got looks a little dark in color.

Printed and looks regular perfectly flat.

Titan	<u>1g</u>	336
Manila	Capal	924
Dust	cotton	336
Chalk		<u>2604</u>
		4200 for 3gal mix

works OK, but gets stiffer with longer mixing - see D 169

Printed and looked regular perfectly flat.

Printed regular - but in "glass mould" (see other side) - Fall print - struck the 660 fine radial back to center of frame (due to sticking on edge of mould holder, 2 prints both cracked Oct 26-18

D-166

Manila	82%	224
Cotton	8%	56
Chalk	60%	<u>420</u>
		700

Reminded and looked regular
 perfectly flat -
 Cracked in removing print
 from mould - beautiful perfect
 print otherwise -

2^d print cracked in mould
 probably in cooling

D-167

Manila	30%	210
Cotton	8%	56
Chalk	62%	434

Made 8K. blank, varnished and baked
regular remained perfectly flat.

Very smooth surface but
cracked in press and stuck
on label —

had water

distilled alcohol

Solvent Naphtha

Turpentine

Benzol

Propylaldehyde

Water Benzol

Salutic acid

acetic acid dissolves a little better than water

acetone

Ammonia 2 3/4 per cent

Olive acid

Stearic acid

Trichlorophenol

Amyl acetate

Shale oil

milky white precip.

dissolves a large portion

dissolves both in water

D 168

Gum Olibanum

not soluble to any extent in any Rosin,
Mastic Copal or Stearic acid. Acetic acid
dissolves most of it and water nearly as
much as acetic acid. All of the ordinary
solvents for gums dissolve only a small
fraction even when heated.

Heat decomposes nearly all of it
before melting. It is softer than kumey
at 100° F. (chewing it) tastes like rosin
seems to be a mixture of rosin and
a very unstable rather soluble substance.

71-169

Prin 800 X⁷

Manila 2475

Cotton 556

Shank 2575

569

128

56

420

700

Prin 336

Manila 1008

Cotton 336

Shank 2520

4200

D-170

Stearic acid	8% x 7	56g
Manila	24%	168
Cotton	8%	56
Clath	60%	420
		<hr/> 700

Very sticky stuck to mould below 100°F
after 24 hours still soft enough to bend
though almost like celluloid.
too much Stearic acid
seems greasy

D-171

Oct 17-1918

Stearic acid	2%	14 g
Manila Copal	24%	168 g
Cotton dust	8%	56 g
Chalk	66%	462 g
		<u>700 g</u>

Left mixer slower than
any other mixture.

Made O.K. blank. Water 106°F.
~~water~~

Stearic Acid	84 g	} Got 21 tied large mixer but reducing valve out of order delayed and batch was not cooked too much? made too dry mix.
Manila	1008 g	
Cotton dust	336 g	
Chalk	2772 g	
	<u>4200 g</u>	

Got 22 tied small mix again and got
too dry due to slow growth something
cooked off or a chain change took place,
burnished and baked regular
warped on baking
Print O.K. except P.O. on label

D-172

Stannic Acid	3%	219
Mahila Copal	24%	168
Cotton	8%	56
Chalk	65%	455
		<hr/> 700

D-173

Flake Naphthalene 37% 21g
Manilla Copal 24% 165g
Cotton 5% 56g
Chalk 65% 455g

25g chalk left out could
not get it in to dry

D-174

Flake magnathum	4%	28
Mammoth Copal	26%	182
Cotton	8	56
Chalk	62%	434
		<hr/> 700

Made a blank but too dry

Made OK, print no cracks
but P.D. on label on one side.
Sundae OK except for
defects apparently in mould.

D 175-

Flake Naphthalene	7%	14
Stearic acid	27%	14
Manita G. al	24%	168
Cotton dust	8%	56
Chalk	64%	448

Made G.K. blank, but
a little too stiff
varnished and baked regular
warped in baking
Printed margin of G.K. ex. P.O.
on one side in color.

Examined box 4 - all around margin
seems mottled as if it was going to
crack later like D-151

D-176

Flake Naphthalene	2%	14
Stearic Acid	2%	14
Rosin	2%	14
Mastic Copal	22%	154
Cotton dust	8%	56
Charb	64%	448
		<hr/> 700

Made B.K. T. blank -
Print G.K. ex, p.D, 500 loaded

D177

Stannic Acid	2%	14	84
Borax	4%	28	168
Marble Gnd	22%	154	924
Attitud dust	8%	56	336
Chalk	64%	448	2688
		<u>700</u>	<u>4200</u>

Made OK, blank - good
consistently.

Large mix was too stiff to
press out. Only got some OK
blank out of it.
Varnished and baked regular
warped in baking
Print off ex. p. O. in table on one
side and large spot on reverse
apparently defect in mixing small
thinner.

Print from large dinner menu
D-177 L.M. - OK as p. O. on label

D 178

Stearic Acid	2%	14
Resin	4%	28
Mastic	22%	154
Cotton	8%	56

*Magnesin Silicate	64%	448
		<hr/>
		700

Varnished and baked regular
waxed in heating

Print off. ex Pull onto
on label and reargen

margin looks like (178) Nov 4-18

D-179

Manila Copal	30%	210	1260
Cotton	8%	56	336
Magnesium Silicate	62%	434	2604
		<u>700</u>	<u>4200</u>

too soft -

Made OK Blank, but
heat $\frac{1}{2}$ in oven - hardened
and baked regular -

Printed regular - 3M. ~~fast~~
Label pull out, good surface

D-180

Stearic Acid	6%	42
Mountain Topel	18%	126
Cotton	8%	56
Chalk	68%	476
	<u>100</u>	<u>700</u>

Combinations with Manila Copal.

D-181

Palmistie acid mixes in all proportions.

makes very soft in large ants. Smaller ant mixture will hard but still very brittle.

Sop Mexican Asphalt mixes in all proportions all very brittle.

Zinc Stearate - dissolves but does not alter brittleness.

Tetra chlor naphthalene dissolves but does not alter brittleness, turns whitish after 24 hours.

Cammarba wax dissolves - no apparent change.

Japan wax dissolves, frame, sticks to plate more but does not alter brittleness.

Spumacet - insoluble or nearly insoluble.

Spum oil - insoluble or nearly insoluble.

Pear wax - not a solvent.

Chinese wax - not a solvent.

Palm wax - not a solvent.

"Bayberry wax" (probably Myrtle wax) fair solvent but brittle in ~~small~~ small ants.

Tallow solvent but not quite as good as stearic acid.

Stearic Acid } all good solvents.
Palmitic Acid }
Oleic Acid } palmitic best.

Asphalt oil fine solvent but brittle in small amounts.

Combinations of other things with Manila Copal.

D-181

Alga oil

Cotton seed oil

Sesame oil

Linseed oil

Poppy seed oil

Caster oil

Palm oil

Cocoanut oil

Neatsfoot oil

China wood oil

all dissolve Manila Copal when hot, and large ants make a rubber-like mass but when small ants are used mass hardens but is very brittle. China wood oil seems to be the best and Caster oil next.

Paraffin will not mix with Manila.

Shall oil mixes and softens but is apparently not a solvent as it turns whitish on cooling.

Stearic Acid Methyl Ester is the best solvent for trial. small amount required to soften leaves perfectly clear mass. Small quantities do not remove the brittle quality of Manila Copal.

Nitrocellulose 6/4 makes fairly light brown brittle mass - seems to combine.

Para phenylamine black brittle mass.

B naphthol dissolves and have a slight softening effect.

Cetane oil dissolves - slight effect if any.

Benzoin Acid - dissolves - softens.

D 181 continued

Tannic acid - (insoluble)
Resorcin acid - dissolves from soft
 physical change if any at all.
Sodium acetate - does not mix
Cupric Ammonium sulphate partly soluble no
 physical change.
Sulphuric acid - dissolves but crystallizes out on
 cooling.
Copper stearate dissolves but heat required
 to make fluid reduces metallic copper - ~~some~~
~~to be changed to stearic acid~~
 seems to free stearic acid which
 softens the Manila Copal.
Resorcin - softens but requires a large amt.
Trichlorophenol - has slight effect.

Resin Soap (with ^{or pure alkali} no free resin) makes the
 mass almost as brittle and weak as resin
 about 25% used.

Benzidine - leaves the dish - no other physical change
Sulfuric acid dissolves - no appreciable phys. change.
Carbazol - dissolves - " " " "
Phenanthrene " " " "
Phthalic Anhydride " " " "
5 Naphthalene " " " "
Pyridine " " " "
Resorcinol " " " "

D 181 Continued,

Tartaric acid dissolves - leaves the dish - no other
 physical change.
Acetarsol - dissolves - no physical change.
Pyrochlorophenol - " " " "
Pyrochlorophenol - " " " "
Pyrochlor - will not mix.
Tonic Acid - dissolves - leaves the dish - removes
the resin considerably stronger
Benzoin Acid clarifies and makes so that
 it will hard without breaking.
Benz Phenol softens something like phenol.
Resin Soap - makes as brittle as resin - leaves
 the dish clean.
Bulls hit mixes well is very brittle if
 hard enough to be of use. About
 half and half is as hard and brittle as
 resin.

Saponified Manila Copal - saponified with caustic soda
 double precipitated with salt washed and dried
 acts like resin soap.

Para chloraniline - softens only in very large amt.
Hexachloroethane - Brittle - no physical change
Benzidine Base " " " "
Saponified Bitumen Gum - 25% shows no appreciable effect
Aniline oil makes very tough rubbery mass

D-182 ~~Standard Oil Co.~~

Asphalt Oil	4%	28g
Manila Copal	24%	168
Cotton dust	8%	56
Chalk	64%	448
	<u>100</u>	<u>700</u>

(390)

too dry 58g would not go in

See (184)

D-183

Benz Phenol 4% 28 g
Mandel Cyel 24% 168 g
Ethyl Dib 8% 56
Chalk 64% 448

100 700

too dry see D-185

D184

Asphalt oil 4% 289
Mastic Copal 28% 1960
Cotton 8% 56
Chalk 60% 420
700

Taken directly from mixer
to press the surface of job is
very dark while the cracked
surface on press stretches job
is to 22% light color.

Remolded and tested regular warped $\frac{1}{2}$ inch

D-185

Bevy Phenol	28 g	4%
Manila Copal	182	26%
Cotton dust	56	8%
Chalk	434	62%
	<u>700</u>	<u>100</u>

Varnished and bebed regular - warped
3/4 inch.

D-186

Boric Acid Cryst.	4%	28 g.
Manta Copal	26%	182
Cotton dust	8%	56
Chalk	62%	434

A little too dry but made an
O.K. blank -

Finished and looks regular
did not warp.

D-187 see (D-179) and (D-156)

Boric Acid crystals, 4%	28 g.
Manila Copal, 26%	182
Cotton dust, 4%	28
Gas black, 2%	14
Magnum black, 64%	448
100	700

Printed blanks without
varnishing - cracked and showed
a tendency to stick all over but
surface about as good as with
varnished blanks.

D-188

Boric Acid dust	4%	28g.
Mamita Copal	28%	196
Cotton dust	4%	28
Magnesium Silicate	64%	448
	100	700

Painted and baked regular warped
about 3 inches

D-189

Raphalt Oil	4%	28	9
Isoric Acid	4%	28	9
Manila Copal	28%	196	9
Cottonseed	4%	28	
Maquicia Silate	60%	420	
	100	700	

Reinforced and looked regular
amplified up in oven

D-190

Boric Acid 4%	28 g
Stearic Acid 2%	14
Manila Coal 26%	182
Cotton Lint 8%	56
Magnesium Silicate 60%	420
100	700

panished and baked regularly
sampled up in oven.

D-191

Boric Acid	4%	28 g
Manila Copal	24%	168
Phenol	4	28
Cotton dust	8	56
Magnesia Silicatica	60	420
	100	700

a little too dry

D-192

Boric Acid	4%	28 g.
Sawdust	26%	182
Phenol	4%	28
Cotton dust	8%	56
Magnesia Silicate	58%	406
	100	700

too soft - press 120° -
 stick to Mitchell slightly
 varnished and baked regular -
 folded three times in oven - very soft.

Proportions.		Grams for 3 gal mixer
3 Chalk. $\frac{43}{43}$	$\times 40$	1740
4 Wood. 57		2280
$\frac{3}{10}$ Rosin. 12		480
Alcohol 50	Kerosene $47\frac{1}{2}$ Alcohol $2\frac{1}{2}$	1900 100
Gas black 2		80

D-193

Nov 12-1918

1720 g Chalk
 2280 g Wood flour
 480 g Rosin
 1900 g Kerosene
 100 g Alcohol
 80 g Gas black.

Kerosene heated on steam plate alcohol added then Rosin (ground fine) stirred in until all is dissolved.

Wood flour put in mixer first. Rosin solution poured on gradually. Well mixed then Chalk sifted on mixed well then Gas black added and mixed until all is uniformly black. - too much was taken for the mixer capacity - and mixing was not as good as with a smaller batch - see opposite page -

Put in vacuum drier 26" diam 35" h
 Steam pressure on pans (35 lb, 281° F
 340 lb 287° F

Made a black oil, stirred out all over press with most of the iron

D-194

Pirin 15%	x7 108 x 6	630
Cotton 8%	56	336
Chalk 77%	<u>539</u>	<u>3234</u>
	700	4200

Small mix ground thru coffee mill
and pressed in regular mounted -
microscope glass cotton films between
the grains.

D-195

Woolly Copal 10% x 7	70
Resin 10	70
Cotton 8	56
Chalk 72	504
	<hr/>
	700

found and moulded like
D-194 - same results -

D-196

REC 8 125

Mamla Copal	13% x 7	91x6	546
Rosin	20%	140	840
Cotton	15%	105	630
Chalk	52%	364	2184
		700	4200

D-197

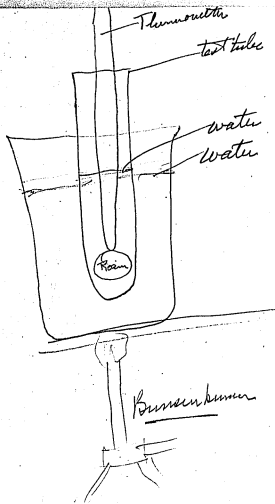
Sheet of white blotting paper
prepared for D-13 - May 31 - 1918 -
Coated with 2 coats regular
black varnish and label
regular, placed on each
side of a D-125 blank and
printed regular, one side
stuck on label and P.O. other
side OK, Printed Nov 14 - 1918

— Accumulator Data —

6" diam = 28,274 square inches,
 with bottom disc on only, gauge reads 120 lbs
 1st row of blocks 8 wts 320 lbs = 2560 lbs
 $2560 + 2827 = 9\frac{1}{2}$ lbs. gauge reads 210 lbs
 2d row of blocks 8 wts 320 lbs " " 305 lbs
 3d row of blocks 8 wts 320 lbs 1840
 $210 + 320 = 640$
 Calculated 38 lbs $\frac{640}{24.50}$ lbs
 4th row 8 wts 230 = 1840 gauge reads 405
 5th row 8 wts 230 = 1840 gauge reads 465
 1st wt on top " " 560
 2d wt on top " " 660
 3d wt on top " " 680
 4th wt on top " " 700
 4 rows 16 blocks pumping 850
 10 rows 16 blocks 1400 lbs
 reading taken with pump stop -
 accumulator going up friction
 in gland adds about 125 lbs
 Put one gallon lube in the
 water Aug 24-18-

sketch opposite

Grade I Rosin - Test by L. Ott,
 at $52^{\circ}\text{C} = 126^{\circ}\text{F}$ the thermometer, when
 slightly pressed against the rosin just
 makes an impression.
 at $57^{\circ}\text{C} = 135^{\circ}\text{F}$ thermometer starts to sink
 in a little of its own weight
 at $75^{\circ}\text{C} = 167^{\circ}\text{F}$ the rosin is like very
 heavy vaseline or tar,
 at $97^{\circ}\text{C} = 194^{\circ}\text{F}$ it is about like soft
 tallow.
 at $100^{\circ}\text{C} = 212^{\circ}\text{F}$ the rosin adhering to
 the thermometer begins to leave and
 rise to the surface of the water.



Mixing Machine table -

Motor 1150 RPM 4 $\frac{3}{4}$ " pulley
(3 pin) Small mixer 125 RPM 12" pulley
(3 gal) Large mixer 165 RPM 23" pulley
Small mixer drive 6" pulley
Large mixer drive 15" pulley
Main drive pulley 21"

Suppose you try an experiment of melting several
 till all kinds - set aside in jacket to cool very slowly say 3
 or 4 hours, break a hole & pour out the liquid part say
 $\frac{1}{2}$ or $\frac{3}{4}$ of it. Repeat this do same thing four or five times
 on — Then you can note the degree of crystallization
 the 3 or 4 crystallization periods. It is called
 the "three" or "four" test & it is a very useful test of
 the purity of the material.

I have been over the atom using
 situation thing in connection with the "three"
 Standard Paper.

They make it out of silver & not be
 rendered by other elements, all Hebrew.
 South a year or two ago they were in
 great demand for "Prime City Paper" which
 was sometimes very thin, sometimes
 very thick, and it was a great deal
 a "special" grade, which has been
 discontinued but it is not as good as
 the old standard for "Prime City Paper".

The way that the paper is made
 stands in regard to the paper and the
 way that the paper is made is
 probably due to the quality of the paper.

I said, pressing the paper most of the
 acid is pressed out but there is
 a large proportion of water in present
 it makes the paper very soft and the
 air is not pressed out as perfectly.
 This causes some considerable trouble
 in cold weather, but in warm weather
 they have no trouble from it in the
 cold pressing.

After cold pressing it is hot pressed
three times, each time the edges of the
cubes are trimmed off and returned to
an earlier stage in the process.

They say that to make a special lot
they would have to run 200,000 lbs of
tinners to get 25,000 lbs in the center of
the lot not blended more or less
with what is used before or after.

They will reject me samples made
after the first warm weather, and
will look out for lots with worse
crystals etc, noting conditions under
which they were made and let me tell
them which are best.

The press cubes are melted up in a
large pot and then ladled into kettles
where it is stirred mechanically
to make it cool to just above melting
point throughout then poured in pans.
They have not changed any of their
process in years.

Very respectfully,
W. D. Dickinson

[ITEM(S) FOUND IN BOOK]

Magnesian Silicate Lanthos
different proportions Poirin

<i>Blank</i> <i>Number</i>	<i>% Poirin</i>	<i>temperature of water in press</i>
142	28%	120°F-122°F-125°F-126°F
134	30%	120°F-121°F-124°F-126°F
139	32%	120°F-122°F-123°F-126°F
141	34%	120°F-120°F-122°F-124°F

30% is best

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- W. W. Dinwiddie Disc Books
Notebook, N-18-12-07**

This notebook was used by William W. Dinwiddie during December 1918-February 1919 for notes on the production of blanks and prints for disc records. There is one additional entry from March 1920. Edison's supervision of this work is indicated by occasional notations in his handwriting and by Dinwiddie's references to his suggestions and comments. The experiments are numbered from D201 through D347. The entries describe different methods of preparation and contain remarks about the results of the experiments, including how the prints made from each blank sounded. Several entries mention that a particular print sounded good or bad to Edison or that "Mr. E can not hear surface." Some entries note the expansion of blanks over a number of days. Also included are lists of chemicals and pigments, along with notations regarding their characteristics and sources of supply. The front cover is labeled "Dinwiddie Varnish D-201 -- Next book is 401--." The pages are unnumbered. Approximately 160 pages have been used.

D-201

175 g. blanc Fixe,

150 g. alcohol,

25 g. resin.

Resin dissolved in the alcohol-blanc Fixe added in pint, well and run thru three times.

Applied with brush to D125-blank, too thick to flow and makes ridges from brush. Does not dry flat - does not crack.

Applied with brush to regular blank is drier than with the 125 and cracks in small checks all over when dried in air only, dries flat and cracks.

D-202

175g blanc Fixe

150g denat alcohol

25g Fine shellac

Shellac dissolved in alcohol, blanc fixe
added in paint mill and run three three

times - thinner than 201

does not dry flat on D125-blanks -
dries flat on regular blanks -
does not crack -

Varnished 2 coats regular varnish
tubed and printed regular.

125 blank warped more.

see note on D-207

D-203

175g chalk

150g denat alcohol

25g fine shellac -

same mixing as 201 & 202

added 50g denatured alcohol later

to thin out - then thicker than

201 or 202 but at the beginning

and after 1st ^{thin} ~~thick~~ run paint mill
it was thinner than 201.

does not stay suspended in solution.

see 206

Alcohol seems to go into the
blanks leaving the chalk dry
and thick like putty almost impossible
to put it on. needs more shellac
see 206 and 208

Cracks when dry.

D-204

Manila copal melted then pulverized.
dissolves in cold - Amyl acetate.

hot - alcohol

hot - turpentine

hot - solvent naphtha

will not dissolve at all in

gasoline either cold or hot.

alcohol plus 20% Amyl acetate
is a better solvent than all amyl acetate

D-205

120 g denatured alcohol

90 g Amyl acetate.

25 g Manila Copal-melted and pulverized.
dissolves very much better than shellac
in alcohol.

put in only 145 g clay and got as
thick as putty.

added 50 cc alcohol 10 cc amyl acetate with

15 g Manila Copal. still too thick
will stand up in a pile to top of beaker
as it comes from paint mill.

added 50 cc alcohol 10 cc amyl acetate
with 15 g Manila Copal again.

sounds good - but many
crackles, see note on 207

206-D.

200 g denatured Alcohol

33 1/2 g fine shellac -

175 g Chalk -

Run thru paint mill 6 times -
got it a little too thick.

207-D.

~~20~~ 150 ~~YURR~~ g denatured Alcohol

40 ~~YURR~~ g fine shellac,

175 g china clay

Run thru paint mill three times.
a little too thick -
does not dry quite flat - too
much shellac -

Record sounds beats 201-210 inclusive.

202 is second beat.

208.D.

150 g. denatured alcohol
40 gr. fine chullae
150 gr. chalk, see 206
put them paint mill 4 times.

too stiff to use set in the
flask so that I could not
shake it up again.

209.D.

100 g. clay.

Rubber solution from Cyl. record, - gum
{ gum rubber + benzol.

added a little benzol in mill to
replace evaporation.

does not pass through paint mill easily
had to open it wide to get it to pass
at all.

Ran thru twice but could not
get smooth. The clay separates
in lumps on the blank. Blank
seems to soak up solvent and
take it from the clay
N.G. cracks on blank.

D-210

Plain rubber solution -
makes very smooth coat -
when dry coats in leaving blank little
(mat) of flat surface.
good surface
see note on D-207

D-211

80 cc regular varnish -
80 cc alcohol -
88 g. china clay.
H.C.

D-212
85 cc regular varnish
85 cc alcohol
37 g Alumina hydrate
better than 211.

D-213
86 cc regular varnish
86 cc alcohol
100 g Phosne white & Zinc white
better than 212

D-214

80cc regular varnish

80cc alcohol

125g 400 mesh silica
a little too thick -

Record sounds rough -

D-215 -

80cc regular varnish

80cc alcohol

100g 400 mesh silica.

Record sounds better than 214 - little
better than regular

D-216

80cc regular varnish

50cc alcohol

125g Lithopone

Sound no better than regular.

D-217

80cc regular varnish

50cc alcohol

125g Magnesium Silicate

Sound, gritty in paint mill
like chalk.

Record sounds very promising.

D-218

85 cc Regular Varnish
85 cc Alcohol
50 g Kieselghur (Kieselgen Löffelstein)
25 cc Regular Varnish
25 cc Alcohol

Record sounds very promising.

D-219

80 cc Regular Varnish
80 cc Alcohol
100 g Blanc Fixe

Promising - better than regular to Rev. E.
muddy in front so good R.O.

D-220

80 cc Fragolan Varnish

80 cc Alcohol

125 g Blanc Fixe.

V. good - best yet. Melody in F much better
than other side evidently due to defective
application

Sec 201
202-219-220-222-223-224

D-221

120 cc Denatured Alcohol R1

80 cc Amyl Acetate

25 g Manila Copal

175 g Blanc Fixe

V. good except crackly start. Melody in F side
crackly - rough spot.

D-222

120 cc Denat. Alcohol

30 cc Amyl acetate

30 g Manila Copal

175 g. Blue Fixe

crashy at start ^{in middle} but inside V good

R.D. at start - better than 221

D-223

120 cc Denat. Alcohol

30 cc Amyl acetate

35 g Manila Copal

175 g. Blue Fixe

V.V. good best yet -

D-224

120 cc Denatured Alcohol

30 cc Amyl Acetate.

40 g Manila Copal.

175 g Blane Fice.

not quite as good as 223.

D-225

one coat regular varnish
for comparison - with 2 coats
on top same as all of the
previous experiments.

About same as regular -

D-226

80 cc Regular Vanish

80 cc Denat Alcohol

35 g Gasblast-

Cracked all over in very
fine ($\frac{1}{16}$ and smaller) areas

D-227

100 cc thin rubber solution

50 g Blaine F.V.C.

Will not mix in paint. will
get granular - seems to take
the rubber out of solution?
too much

D-228

100 cc thin rubber solution

25g Zinc White

Mixed very well

poor

D-229

100 cc thin rubber solution

25g Magnesium Silicate

Mixed very well - but some
of the solution or it would
have taken more silicate
rather

D-230

100 cc thin rubber solution

14 g - Kieselghum.

seems too thick

Problems peeling off in center
of rim

D-231

80 cc regular Vermiculite bag

80 cc alcohol gas block

100 g "Clay Star"
fan

D-232

80 cc reg varnish bottle. less gas black

80 cc alcohol

100 g precipitated chalk.

too thick but very
much better than varnish
containing ordinary chalk.

N.C. did not print.

D-233

Same as 232 except used
only 50 g - precip. chalk.

Printing

D-234

30 cc regular vanish bottle. also black

30 cc. kiesel

50 g Potassium smoke.

fin.

D-235

Same as D-232 except use
only 75 g precipitated chalk.

fin only

D-236

80cc Propyl 64 Winc. without gas black

80cc Alcohol

30g Alumina Hydrate,

mineral is a little thin -

N. G.

D-237

80cc Prop. var. 64 Winc. without gas black

80cc Alcohol

125g blanc Fixe.

b good. P.D. is melody in F
side.

D-238

80cc PyVar & 50cc without backlash

80cc Alcohol

125 g Berium Carbonate

fair to good

D-239

80cc PyVar & 50cc without Backlash

80cc alcohol

75 g Flange White Seal Zinc White

good on Spring Rang

fair to good on other kind

D-240

80cc Kypbar 6^{1/2} Visc without gas black.

80cc Alcohol

125g Lithopone.

Fair

D-241

80cc Kypbar 6^{1/2} Visc without gas black.

80cc Alcohol

125g Magnesium Silicate.

only fair

D-242

80 cc. Kieselguhr. 6⁴⁶ vials without Goo black.

80 cc. Alcohol

35 g Kieselguhr.

too thick

Land Surface.

D-243

Same as 242 except used only 25 g Kieselguhr

only fair

2 lb. ground Phenol Resin from Hoffman -
Free phenol 16% viscosity 45 sec.

D-244-

100. g. Phenol Resin visc. 45 sec, free phenol 16%

6 g. Phenol

1 g. Para

7.8 g. $\frac{1}{4}$

200 g No 1 Denatured Alcohol.

Shake in flask to dissolve and
divided into two equal parts by weight.

D-245
1/2 of barium D-244 (157g)
200g blanc Fixe.

see 256
D-246
1/2 of barium D-244 (157g)
50g denatured alcohol.
200g blanc Fixe.

246-a one coat fair - a little better than reg.

246-b two coats v. good

246-c three coats. good -

throughout region on top 246-c - barium
cracks in fine radial cracks - but sounds
very soft -

following Phenomenon
Edison Coat has
general Conclusions
surface

D-247
200g Alcohol.
6g Phenol
78g 4/4.5
1g Para
100g Phenol Resin

D-248
1/2 of Varnish D-247 (157g)
20g Distilled Alcohol
200g Blanc Fixe

248a-one coat + 2 coats regular *fine*
~~800k 12 coats~~

248-b two coats

248-C Two coats, very good uniform

D-249
1/2 of varnish D-247
35 g denatured alcohol
200 g Blanc Fixe.

249-A - one coat.

249-B two coats.

249-C three coats.

D-250
1/2 of varnish same as 247 157 g
10 g denatured alcohol.
100 g blanc fixe -
4 g gas black.

250A - one coat. poor

250B Two coats good - low dirt pickup

250C Three coats - one varnished 2 coats regular
one not varnished
long wear face

D-251
 $\frac{1}{2}$ lot varnish.
10g. Alcohol.
200g blanc Fixe

251 A one coat.

251 B Two coats, + 2 coats regular

251 C Two coats + 1 coat regular

better without regular on top.

D-251
 $\frac{1}{2}$ lot ~~hannish~~
10 g Alcohol
200 g blanc Fixe

251 A one coat.

251 B Two coats. + 2 coats regular

251 C Two coats + 1 coat regular

better without regular on top.

D-252
1/2 of varnish same as 247

252 A one coat

252 B two coats

252 C three coats

252 D four coats.

best with 1/2 in. top of any so far
that had resins on top.

D-252

~~100 g~~ varnish same as 247

300 g blanc fixe

4 g gas black.

20 g denatured alcohol.

D-253

$\frac{1}{2}$ of greenish same as D-247 (1579)

100g Blue Fine

4g Gas Black.

253-A one coat top coat reg - 1 sand surface.

253-B 2 coats sand surface

253-C 0 coats sand surface

D-254

$\frac{1}{2}$ of barnish same as D247.

20 g Alcohol.

1.00 g blue F.V.C.

4 g Gas black.

254-A 1 coat bond surface

254-A 1 coat with 1/2 up onto bond surface

254-B 2 coats bond surface

254-C 3 coats - better than 104B

D-255-

200 g Solvent Naptha.

100 g Phenol Resin.

after shaking a long time only a small
portion dissolved.

added 25 g alcohol and all separated
from the naptha into a ball -

Same as 246

D-256

$\frac{1}{2}$ of Vermish like 247

50 g denatured alcohol

200 g blanc fixe

256-A - one coat.

Mr. E. mostly lean ground surface - full of fine cracks.
Not checked, fine except for (dirt?) R.C.

256-B Two coats.

Studs & P. O. all over one side

256-C three coats. poor

D-257

$\frac{1}{2}$ of Vermish like 247

60 g denatured alcohol

200 g blanc fixe.

257-A one coat. Prother

257-B Two coats. H.C.

257-C Three coats. H.C.

D-258
 $\frac{1}{2}$ of varnish like 247
100g blanc fixe

258-A one coat.

258-B two coats.

258-C three coats.

* Critical preparation of blanc fixe.

D-259
 $\frac{1}{2}$ of varnish like 247
100 g blanc fixe.

259-A looks yellow but is scarcely a small surface,
fair \rightarrow good

* 259-B looks dark - black shows thru,
only fair

* 259-C looks dark - black shows thru, darker than B.
good

got 5 lbs Phenol Resin lot X122
Viscosity 45 sec Fin Phenol 16% No 000-1918
used this on D-260 stump:

D-260
same as 258

260-A (1) 1 cut
Very good surface no points.

260-B @ 2 cuts
All pulled out N.G.

D-261

$\frac{1}{2}$ of varnish like 247

125 g Blanc Fixe

261-A - ② coats
looks fair - no cracks - no P.O.

261-B - ③ coats
better than A - no cracks - P.O.

-262

$\frac{1}{2}$ of varnish like 247

120 g Blanc Fixe

both Blanks much more absorbent than side

262-A - (2) 2 coats

fair to good

D-263
 $\frac{1}{2}$ of varnish like 247
 140 g Blanc Fixe,

263-A- ③ - 2 coats
 fair to good q. on surface rough cracks

263-B ② - 3 coats, one Northwood was scratched away

D-264
 200 g alcohol
 9 g phenol (6 inches²?)
 78 g $\frac{1}{4}$ "
 2 g Bna
 100 g Phenol Resin

$\frac{1}{2}$ of varnish
 50 g dust Alcohol
 200 g Blanc Fixe

Coats well dried before another coat.

264-A ③ - 2 coats

264-B ③ - 3 coats

D-265
1/2 of varnish 264
150 g blanc Fixe

(MC 259)

Coats well dried before another coat

265-A (2) 2 coats

265-B (2) 3 coats

D-266
200g Alcohol
6g Phenol
7g 6/4
2g Para
100g Phenol Resin.

take 1/2 of varnish
50g distil alcohol
200g Blanc Fixe

266-A one coat.

266-B two coats.

D-267

$\frac{1}{2}$ of varnish 266

150 g. Blanc Fixe.

- covers well -

267-A one coat.

267-B two coats

D-268

200 g Alcohol

6 g Phenol

7.8 g $\frac{1}{4}$

2 g Para.

100 Phenol Resin

1.5 g varnish with
120 150 g Blanc Fixe
0

268 A - ② (one coat 267 then 1 coat 268)
both much more abundant on one side

268-B ② 2 coats

D-269
1/2 of barium 268
100 g blank Fixe

269-A ②
2 coats

269 B ③
3 coats

not made
D-270
1/2 of barium like 268
150 g blank Fixe.

D-271
1/2 of varnish like 268 (with 25 g paint)
150 g red lead

a - 1 coat

B - 2 coats. Same as D.VI, good Dec 7-18

finer to good - each black mixed Jan 16

D-272
1/2 of varnish like 268
150g lead chromate.

a one coat

b - two coats. Same as D.VI, good Dec 7-18

a little better than fin to good Jan 16

270
 $\frac{1}{2}$ of lot of varnish like 268
150 g dry white lead - old Dutch House, Netherland

A - 1 coat

B - 2 coats fine surface

274
 $\frac{1}{2}$ lot of varnish like 268
150 g varnish-makeup litharge - Netherland Co.

A 1 coat

B 2 coats good surface

D-275
1/2 of varnish like 247
12 g. Bone black.
ground then mill six times.

271-B-275-
272-B-275- lousy
267-A-275 only fair
269-A-275 fair to good
266-A-275- not cracked like the 275 and but (beamed) coats
265-A-275- lousy cracked all over.
265-A-275- fair
264-B-275- (lousy) fair to good
259-B-275 nearly fair to good
263-A-275 fair to good
258-B-275 fair
262-A-275 fair to good.
258-A-275 fair to good - nearly good
257-A-275 only fair

D-276
1/2 of varnish like 247
150g Red lead

276-B - (2) two coats -

276-278-^② Coat of 278 put on first then after 2 hrs
one coat of 276.

276- all earlier numbers take first,

D-277
1/2 of varnish like 247
150 g Lead Chromate.

277B- ② coats 277

277-278- ① coat of 278 put on first 2 hrs later coat 277.

277- earlier numbers taken first.

as 276-277

D-278
varnish like 247
100 g dust alcohol
400 g Blanc Fixe.

D-279

1/2 of barnish like 247

100 g Blane Fire

50 g Red Lead

one coat 278 + 1 coat 279 - @

279-B - @ 2 coats 279 fair to good

268-A-279 - baked before 279 coat, cracks (good quality)

263-B-279 (crackles - fair to good gun surf)

266-B-279 (fine crackles fair to good gun surf)

D-280

1/2 of barnish like 247

100 g Blane Fire

50 g Red Chromate,

one coat 278 + 1 coat 280 @

280-B - 2 coats 280 poor fair to good

268-B-280 } baked before 280 coat. ~~fair~~ good (good)

267-A-280 } fair only

264-B-280 } not full paint
 (good)

280-B.F. Blane Fire rubbed in by T. Hill,
pours of Blane fire + 1 coat 280 fair

280-A 1 coat 280.

D-281

~~Fin
Boiled linseed oil } equal parts
200 g above
20 g Lead Peroxide.~~

~~Ground them paint mill stone~~

~~Put in oven 4 PM Dec 9-18 -~~

Lead Peroxide should have been
brought to 400°F in the mixture before
applying to blankets

Dec 10 - 11 A.M. 281

Put into blender equal parts rosin
and boiled oil. and put in oven
- turn out of oven 9 AM Dec 12

See 294-295

D-282

1/2 of barnish like 247
100 g Blanc Fixe
50 g Red Lead.

5 blankets recasts marked 282-13

Samples give to good

fine Jan 16
P.O. on print.

D-283

1/2 of bernick like 247

100g Blue Five

50g Lead damage.

5 blanks 2 cents marked 283-B

Sound ~~fine~~ to good.

fair to good Jan 16
8/19, per hit!

D-284

1/2 of bernick like 247 Bone Black

40g T.L.S. Lotus Black - J. New Smith Co.
only fair

Good - Jan 16 -

D-285-

$\frac{1}{2}$ of variety like 247
24 g Prussian Blue.
only fair

Extra good Jan 16-
P.O.

D-286-

China wood oil rubbed into two blanks
put in oven Dec 11 - 9³⁰ AM.
Taken out Dec 12 - 9³⁰ AM.

See 294 and 295

D-287

- 1 Varnish makers lithaen Nat. Lead Co.
- 2 Fry white lead Old Dutch Process " " "
- 3 Varnish makers Red lead " " "
- 4 Flash white lead (New House) " " "
- 5 Lead acetate of lead " " "
- 6 Sublimed white lead Eagle Lithum lead Co.
- 7 Sublimed blue lead " " " "
- 8 AAA Orange Mineral " " " "
- 9 Red lead " " " "
- 10 Powdered lithaen " " " "
- 11 Carter white lead Carter White lead Co. Chicago -
- 12 Super Whiteing L.H. Brothers Co., Jan 3-1919
- 13 Calcium Carbonate Sh. " Jan 18-1919
- 14 " " 153 " " "
- 15 6L Chrome green " " 21 "
- 16 8D " " " " "
- 17 L Chrome yellow " " " "
- 18 M " " " " "
- 19 J " " " " "
- 20 Cadmium yellow " Jan 20 1918
- 21 Carbonate of Magnesia " " "

Crystals - H.C.

Crystals -

Crystals -

fine - lumps of clear -

fine

V. fine - some lumps -

V. fine - some small cryst.

fine and less crystals than B

like B

Like 1 March 4, 1920 pried up. like dry paste -

V. fine - clean -

Marble dust

V. fine

V. V. fine

fine

Chase

V. fine

V. fine

V. fine

V. V. fine

looks like fine talc -

D-288

1/2 of barnish like 247

150 g Redlined White Lead (Eagle Picher Prod Co)

288-B @ 2 coats

uncertain amount
from surface UV grade -
Spectroscopic analysis surf. for - Snaps -
gelling continuous

Jan 16

- D-289 -

1/2 of barnish like 247

150 g Redlined Blue Lead (Eagle Picher Prod Co)

289-B - @ 2 coats.

good to very good - Jan 16

D-290. (see D-281)

20 g Boiled linseed oil }
20 g Rosin } Heated to 400°
4 g Peroxide of lead - }

Put on thick on one side of
blank - too stiff to do anything with it.

Heated blank in oven and reheated
mixture and put on both sides of blank
but still too thick.

Put in oven 11:30 Am Dec 11

at 12:15 took out of oven and wiped
off all surplus that I could while hot
and put it back. two inches can not get dry

D-291

Plain China wood oil rubbed into
a blank until no more would go in
put in oven 10:30 Am Dec 11

out of Am Dec 12

see 305

D-292

20g China wood oil } heated to 300° -
20g Rosin }

292-A. Rubbed in with fingers - but not
left dry like 291 - too thick -
wiped off after one hour on one
leg 308

292-B Thinned with equal part of
dist. alcohol and applied with
a brush. Put in oven 23rd Dec 11
out Dec 13 - 9 AM
see 305 and 306

D-293

Plain lined oil rubbed in with fingers.
Put in oven 320 PM Dec 11 (11)

out 9 AM Dec 13
see 305 and 306

D-294

1/2 of varnish like 247
150g Carter white lead.

291-294

286-294

294 - ④ 2 coats

Good Jan 16

pull auto

extra good Jan 16
fair - Jan 16

D-295-

1/2 of varnish like 247
150g varnish + white lead - Not head Co.

281-295-

286-295-

295 - ④ 2 coats

fair to good Jan 16

Extra good Jan 16

only fair Jan 16

D-296

1/2 Danish like 247 (see 297)
40 g Florence white Seal Time white
75 g Carter white lead.

296 D-2 coats

fair to good Jan 16

D-297

1/2 Danish like 247
75 g Lithopone (see 296)
75 g Red lead - Danish wash, Not good.

297 - D 2 coats

good - Jan 16

D-298.5

one coat ^{of} linseed oil rubbed in
with fingers.

Put in oven 10⁴⁵ AM Dec 13

temp about 150°F.

Out of oven 4³⁰ PM. Dec 13 See 305-306

see 305 and 306

D-299.5

one coat ^{of} linseed oil rubbed in
with fingers

Put in oven 10⁴⁵ AM Dec 13

out at 4³⁰ PM Dec 13

2d coat Boiled linseed oil put on
warm blankets and put back in
oven 5 PM.

out 4³⁰ PM Dec 14.

see 313 and 314

D-380

one coat boiled linseed oil rubbed
in with fingers

Put in oven 10⁴⁵ AM Dec 13

out 10⁴⁵ AM Dec 14

See 313 and 314

D-381

one coat boiled linseed oil
rubbed in with fingers

Put in oven 10⁴⁵ AM Dec 13

out 11:30 PM Dec 14

See 313 and 314

D302

one coat China wood oil
rubbed in with fingers

Put in oven 10⁴⁵ AM Dec 13

out of oven 4:30 PM Dec 13 see 205-206 *

see 305 and 306

D303

one coat China wood oil
rubbed in with fingers

Put in oven 10⁴⁵ AM Dec 13

out at 4:30 PM Dec 13

2nd coat China wood oil put on
warm blankets and returned to
oven 5 PM

out 4:30 PM Dec 14

D304

one coat China wood oil rubbed in
with finger.

Put in oven 10⁴⁵ Am Dec 13

out 10⁴⁵ Am Dec 14

see 313 and 314

D-305-

1/2 Barnish like 247

128 g Flake White Lead (New process)

102 g China White Lead.

271-305 = 271 with 2 coats 305

272-A-305 272-A with 2 coats 305

272-B-305 272-B with 2 coats 305

273-305 273 with 2 coats 305

278-305 278 with 2 coats 305

fair

fair

302-305 - Bottle

D-306

Dec 13-18

1/2 Danish like 247

150g AAA Orange Mineral Engraving

292-13-306 = 292 B with 2 coats 306 good

293-306 = 293 with 2 coats 306

298-306 = 298 with 2 coats 306

302-306 = 302 with 2 coats 306 badly

306-13 = 2 coats 306 good Jan 17

D-307

1/2 Danish like 247

150g Lithopane

① - 2 coats - fair to good Jan 17

only fair Jan 17

D-308.

$\frac{1}{2}$ of varnish like 247.

34 g Aluminum Hydrate.

10 cc alcohol

② (2 coats)

fair to good Jan 17

D-309

$\frac{1}{2}$ varnish like 247

120 g Blane Fire - J. Lee Smith & Co.

two-thirds - only one coat put on

D-310

$\frac{1}{2}$ lot of varnish 247

~~at~~ a special bone black - blue bluish etc.

only 25 lb put in - too thick put on
only one coat.

fine to good Jan 17

D-311

$\frac{1}{2}$ lot of varnish 247

24 g Alumina Hy drate.

(H) $\frac{1}{2}$ coats

very good Jan 17

D-312

1/2 lot of varnish lib 247

80 g of Florence White Seal Time Glaze

4-2 coats -

very good Jan 17

313

1/2 lot of varnish lib 247

150 g Eagle Kitchen Red Glaze.

309-310. ② one coat 309 + one coat 313 "good" Jan 17

249-313 two coats 313 on top

1

300-313 " " " " "

301-313 " " " " "

304-313 " " " " "

313 ③ ^{two} coats fair to good Jan 17

Viscosity of varnish 150

D-314

1/2 lot of varnish like 247

150 g Eagle Piston grease Dublind white lead.

304-314 one coat 304 - one coat 314 better than good

244-314 two coats 314 outlay

300-314 " " " "

301-314 " " " " good Jan 14

304-314 " " " "

314 ② ~~two coats~~

Viscosity of varnish 320

D-315- Varnish

Dec 18-1918

new lot 6 lbs Phenol Resin

free Phenol 15%

Viscosity 30 sec.

D-315- see D 247

200 g Alcohol,

700 Phenol

7.5 g 6%

1 g Vars

100 g Phenol Resin

D-316.
1/2 of Varnish 315-
150g Eagle Pitcher Red Lead

viscosity of varnish 132 (see 313)

D-317
1/2 of Varnish 315-
150g Eagle Pitcher Sublimed White Lead,

viscosity of varnish 353 (see 314)

Variation in viscosity is mainly due to
coarseness in mill, for same pigment.
316 and 317 were made from same lot of
varnish - and 313 & 314 were made from
same lot.

White lead is much finer than
red and stays suspended many
times longer. This causes the
greater viscosity of white lead varnishes.

D-318

$\frac{1}{2}$ of varnish like 315

175g Barium chromate.

D-319

$\frac{1}{2}$ of varnish like 315

160 g Ultramarine.

too thick - put on only one coat

very good Jan 11

D-320

$\frac{1}{2}$ of barium like 315-

75 g Ultramarine-

Very good Jan 17

D-321

$\frac{1}{2}$ of barium like 315-

50g Strontium chromate.

Struck ~~it~~ would probe
print in half-

D-322

$\frac{1}{2}$ of varnish like 315

5 g Ultramarine

140 g Eagle Platinum White Lead

4 - 2 coats

very good Jan 17

D-323

$\frac{1}{2}$ of varnish like 315

50 g Cadmium Sulfide -

4 - 2 coats

D-324

$\frac{1}{2}$ of barium like 315-

130g Lithoplene.

10g Calcium Sulfide.

10g Ultra Marine.

D-325-

$\frac{1}{2}$ of barium like 315-

150g Eagle White Lead.

10g Strontium Chromate

10g Ultra Marine.

D-326

$\frac{1}{2}$ of varnish like 315

75 g ~~of~~ ^{Engl} Potash Sublimed White Lead

75 g " " Red Lead

good Jan 17

D-327

$\frac{1}{2}$ of varnish like 315

75 g Engl Potash White Lead

28 g Cadmium Sulfide

brilliant golden yellow before baking,
sounds a little better than "good" Jan 17.
beautiful golden record -

D-328

$\frac{1}{2}$ of varnish like D15

120 g Lithopane

15 g Ultramarine

D-329

$\frac{1}{2}$ of varnish like 315

150 g Blanc Fixe

D330

$\frac{1}{2}$ of Vermish like 315
145 g Lithiophane
3 g Lithiamine

D331

$\frac{1}{2}$ of Vermish like 315
50 g Fluorapatite and Zinc white
75 g White lead.

D-332

50g Fluence White Seal Tins White

75g Lithophone

with $\frac{1}{2}$ of Vermish Lho 315

Sounds V.D. good to Mr. E. Jan 22

D333

75g White Lead

75g Blane Fike

with $\frac{1}{2}$ of Vermish Lho 315

Sounds V.D. good Mrs. E can not hear
surface after 1" in from start zone

D334,
1/2 of Varnish like 315
100 g White Lead
50 g Florence White Seal Zinc White

D335
Friday Jan 17-19 - 4 Am.
50g boiled linseed oil 50g Ilexin put in
stain plate until Ilexin dissolved. Thoroughly rubbed
into regular blank with fingers. Air dried
until Jan 20, 9 Am. put in oven at 170°
until Jan 21 1030 Am -

see 336 and 337 also

D-335-13

~~W333M~~
Expansion of regular blank.

Micrometer reading f. 5178 temp. 70° F Jan 20 ^{4 PM}
~~5068~~ " { 5068 " 275° F Jan 20 ^{9 PM}
 " " { 5083 temp 77° F Jan 21 ^{10 AM}
 " " { 4971 " 275° F Jan 21 ^{2 PM}
 " " { 5038 " 80° F Jan 22 ^{8 PM}
 " " { 4965 temp 297° F Jan 22 ^{10 PM}
 " " { 5102 temp 76° F Jan 23 ^{10 PM}
 " " { 4955 temp 272° Jan 23 ^{3 PM}
 " " 5050 temp 78° Jan 24 ^{4 PM}
 left in oven to change - 4870 temp 205° 8 PM
 4720 temp 76° 115 PM

D-336 Jan 21-19

1/2 lot similar like 315-

25 g Cadmium Sulphide
 15 g Alumina Hydrate

335-336 - shows very badly mottled

D 337

Jan 21-19

$\frac{1}{2}$ lot of barium chloride 315
25g Cadmium Sulfide
75g Lithopone

D-338

see also (320)

$\frac{1}{2}$ lot of barium chloride 315

75g Ultra Marine

D 339

75 g. Eagle Potatoes Red Head.

25 g. Carduus Nuttallii.

$\frac{1}{2}$ lot of Danish like 310.

D 340

~~225~~ g. Hay. Danish -

1 g. Boiled down at -

D341

1/2 lot of varnish like 315
90 g. of chrome yellow "light"
L.H. Buttler Co.

D342

See 345

1/2 lot of varnish like 315
110 g. of chrome yellow medium
L.H. Buttler Co.
too thick -

D343

$\frac{1}{2}$ lot varnish like 315 —
100 g. Cp. Chrome Yellow Dark
L.H. Butcher Co.
It don't seem to soak into blanks
much more than 341 or 342 and
considerably more than 344.

D344

$\frac{1}{2}$ lot varnish like 315 —
100 g. Chrome Green, Quindens 6L
L.H. Butcher Co.

D-345

See 346

$\frac{1}{2}$ lot of varnish like 315 -
100 g. c.p. thionine yellow Kuden

D-346

$\frac{1}{2}$ lot of varnish like 315 -
g. Precipitated Calcium Carbonate
L.H. Kuten Co.

Samples of Pigments

(2347)

- 1 "B" Carbon Black L.H. Brothers Co. Lillo Jan 23-19.
- 2 Priming Smith No. 1 ~~black~~ black -
- 3 Special Pigment (300 mesh) from J Lee Smith Co Feb 17-19
- 4 Clay - The Atlas Co. 25 Beaver Street, N.Y. 10011
- 5 "Rotten Stone" "Argillite" L.H. Chemicals Co. Pittsburgh.
- 6 Kieselguhr ground in Ball mill for 2 hours.
- 7 Titanox BX Pigment. Titanium Pigment Co. Inc. Niagara Falls.

8

9

10

11

12

13

14

Samples of Pigments

D247

Coarse crystals and coarse foreign particles, ^{but some fine}
 a few coarse crystals - dark color. Compares well with pigment X
 looks like black fire.
 looks like black fire. - Titania oxide 20-26% Barium Sulphate 74-75%.

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- W. W. Dinwiddie Disc Books
Notebook, N-19-01-10.1**

This notebook was used by William W. Dinwiddie and his assistant Henry E. Thayer during January-July 1919 for notes on the production of blanks for disc records. There is one additional entry from October 1919. Edison's supervision of the work is indicated by Dinwiddie's references to his suggestions and comments. The experiments are numbered from D401 through D467. The entries describe the methods used in the manufacture and preparation of the blanks, particularly the baking process, and contain remarks about the results of the experiments. Several indicate that a particular print sounded good or bad to Edison or that "Mr. E can't hear surface." Also included are lists of clays, along with remarks about their characteristics, sources of supply, and prices. The notes indicate that W. R. Simpson assisted Dinwiddie in some of the work and that Charles T. Dally used some of the same materials as Dinwiddie in his experiments. Pasted into the book is a one-page note by Edison pertaining to a patent on a shellac substitute that he wanted Dinwiddie to try. The front cover is labeled "Dinwiddie D-401 -" and "Disc." The pages are unnumbered. Approximately 100 pages have been used.

January 10 - 1919

II 401

Ball mill made from
Tunker was furnished Dec 14 - 1918

II 401

70 g garnet lac ground in coffee mill
36 g rosin fine ground in " "
280 g No 1 Denat. Alcohol.

Shaken in flask until all dissolved.

70 g cotton dust.

977 g fine china clay - "Southern" from Shields.

$$\begin{array}{r} 977 = 84.8\% \\ 70 \quad 6.9\% \\ 70 \quad 6.9\% \\ 36 \quad 3.8\% \\ 1152 \overline{) 77000} \quad (84.8\% \\ \underline{9216} \\ 5540 \\ \underline{4608} \\ 932 \end{array}$$

Added the clay so
slowly that the
alcohol dried out.

$$\begin{array}{r} 1152 \overline{) 7000} \quad (6\% \\ \underline{6912} \\ 880 \end{array} \quad \text{Put with 402}$$

D 402

42 garnet loc 6%

28 Rosin 4%

42 Cotton dust 6%

588 Clay 84%

700 100%

168 Alcohol 28%

Made a very wet mix -

Can be made with considerably less alcohol.

Broke up into small pieces and dried in vacuum drier for 2 hours - Pump being used by "blino" at same time, only 18"-22" vacuum. Steam 10-20 lbs. a plate.

Made one blank Jan 13-19 - too soft - not enough binder

D403

42g gamut lac 6%

28g Roim 4%

42g cotton dust 6%

* 588g chalk - 84%
100%

168g Alcohol.

Made 3 PK. blanks, Jan 13-19

varnished with 288 varnish -

one printed gave pull outs all over.
coated the other two with reg varnish Jan 17.

D 404

70g	garment lace	10%
42g	rosin	7%
56g	cotton dust	8%
52.5g	clath	75%
700		
17.5g	alcohol	

Made 3 lts like above in small mixer -



3 blanks exp. except for five marks like
above apparently cracks

2 coated with reg varnish -
1 " " 258 varnish -

Sounds V.V. good Jan 22

Mr. Elson can't hear surface

D 405-

Garnetum	8%	56
Rosin	6%	42
Cotton	8%	56
Charb.	75%	546
	100%	700

Alcohol 175g

Made 4 blanks -

coated 2 with 288 varnish
and 2 with reg varnish -
fine cracks showed in two of the
blanks similar to the cracks in
404 but not so numerous. Evidently
blank is still too rich.

D406

Garnet	8%	$\times 7$	56g
Resin	4%		28g
Cotton	8%		56g
Chalk	80%		560g
			<u>total 700g</u>

175g Alcohol

One printed full across Margin
and Varinish cracks 2 one radial from
edge seems to be in blank. T.H.G.

D+07

Garnet Loe	4%	x 7	56g
Rosin	8%		28g
Cotton	8%		56g
Chalk	80%		560g
			<hr/> 700

Alcohol 175g -

Bottom margin - looks good -
 much lower surface than the
 ground oil layer Dally is using - and
 a little more than regular -

2-408

Garnetite	8%	x 7	56 g.
Parin	4%		28
Cotton	8%		56.
Chalk	80%		<u>560</u>
			700 g

Alcohol 175g.

G.K. ~~Prescott~~ except P.O. on edge -
Condensation regular -

D-409

Barnet Lee	87% x 7	56g
Resin	4%	28g
Linseed Oil	1%	7g
Cotton	.8%	56g
Chalk	79%	<u>553</u>
	100	700
150g	Alcohol -	

"Cimmeron" Resin "Koppers Moulding Resin"
 Sample #4548 from H. Koppers Co. Laboratories
 Chas. and Mackay Street, Pittsburg, Pa.

Solubility.

disolves very freely in Benzol, Solvent Naphtha
 X Carbon bisulphide, carbon Tetrachloride,

Amyle acetate.

* Resin will not dissolve at all
 Kerosene dissolves a very small fraction and
 Straw oil is not a solvent

Linseed oil dissolves a fraction

Spirits of Turpentine dissolves a large fraction.

With Carbon bisulphide a small fraction
 is undissolved though most of it dissolves
 very quickly.

D-410

Asphalt 3 1/2
 Cotton
 Chalk

15% x 7 = 105 g
 8% = 56 g
 77% = 539
 100% = 700

Solvent Naphtha 175 -

Asphalt.	10%	x 21	210
Resin.	5%	x 21	105
Cotton	8%	x 21	168
Chalk	77%	x 21	1617
	100%		2100

Solvent Naphtha - 175 x 3 = 525

D411

Neoplast 12% $\times 5 = 60$ g

Acres 8% 40

Cotton 20% 100

Chalk 60% 300

total 500

Solvent Nujol 150 g

W.B.

D 412

Condensate Reim 10% x 7	70 g
Tara 1/2 of 1%	.5 g
Cotton 8%	56 g
Chalk 82%	574 g
<u>Alcohol 175 g</u>	<u>total</u> 700.7 g

Made 4 blunders at this and ground
in ball mill - after drying in vacuum
drier —

Varnished Feb 18-19

Split in two in printing stack
hopelessly to the middle on both sides
and had to be soaked off. — Easily
noticeable in alcohol showing that condense
was not completely cured. longer
schedule in press make bring one
out to H. Feb 21-19.

413

April 2-1919 -

Experiment to see if record may be permitted in hot press and transferred to cold press to cool.

Made two O.K. prints by this process one required 40 sec to transfer and the other 30 sec. showing that if presses are rigged up side by side there will be no difficulty to operate quickly enough when only punching thru is required. -

This was to test out scheme suggested March 27-17 and filed in legal department.
double hydraulic press -

Hot press on one side }
cold press on other side } separate runs -
Circulate oil at constant temperature in
hot press - to obtain highest temperature.
Oil will give higher and more constant
temperature than steam.

413½

1/4 China wood oil } heated in casserole over
1/2 I Proin } burner flame, and took
off small sample on glass plate and small
slides to 610°F then let cool - Heated
again to 610°F - material thicker but
not condensed. Heated a third time
to 610°F and cooled. seems somewhat
elastic when drawn out in a thread it
springs back.

D 414

April 18-1919

100g China wood oil

100g I Proin.

in casserole over burner -

10¹⁰ Proin. Start.

10²⁰ melted flame off for about 3 minutes.

10³¹ 300°

10³³ 350°

10³² 400°

10⁴³ 500° Adjusted flame low

10⁵¹ 500°

11⁰⁰ 475°

11¹⁰ 496°

11²³ 506°

11³⁰ 506°

12⁰⁰ 508° Gas off

12⁰⁹ PM Cold - very sticky - not elastic

A Melted and poured out 100g in (D 558) -

Started to heat remainder, 1/2 Proin.

129 510° Adjusted flame down

131 530° " " "

132 502° " " up

143 500°

149 502 Flame off -

49g left

25% loss -

10⁴³ 535°

10⁴⁶ 535°

10⁵⁰ 537° Off. Selly forming around edges
weighed out one lot 80g
one lot 60g
about 10g left in casserole.

$$4 \times 80 = 320$$

$$\frac{80}{390 \text{ g total from } 500 \text{ g to start.}}$$

$$110 \text{ g loss} = 22\%$$

A

D. 413 - April 18

Melted on steam plate 250g Platin in 250g Tung Oil.

Started over Bunsen flame at 4¹⁵ PM

4²³ PM 230°

4²⁵ 370° put iron screen around flame

4²⁸ 435°

5⁴⁹ 460° Off -

8²⁰ AM Start over, April 19 -

8³² 250°

8³⁸ 280°

8⁵⁵ 500 Added another burner.

9¹⁹ 490

9⁴⁵ 490 Adjusted gas up.

9⁵⁵ 510

10²⁰ 516

10²⁵ 525°

10⁴² 365°

10⁴³ 400°

10⁴⁵ 440°

10⁵⁰ 520

10⁵¹ 530

10⁵² 500

10⁵⁴ 490

10⁵² 502

10⁵⁶ 530

10⁵⁸ 535°

See D. 560 -
Off and measured out 3 lots of 80g each.
Started heat again on remainder.

559-1
559-2
559-3

D-416

April 1 - 19

250g China wood oil 250g Resin -

Start with 935 from two burner burners

250° 10²²305° 10²³ All resin just melted385° 10²³400° 10²⁰465° 10¹⁶490° 10³⁰510° 10²³ Flames adjusted down515° 10²⁴416-A 520° 10²⁵ Off weighed out 80° for D-560-1445° 10²⁹ Started again445° 10²⁰ Flames adjusted up.460° 10²³470° 10³⁵492° 10²²505° 10⁴⁰ Flames adjusted down500° 10⁴⁴495° 10⁴⁷416-B 502° 10⁵¹ " " up Off weighed out 80g for D-560-2430° 10⁵³490° 11⁰⁰500° 11⁰¹ flame adjusted down502° 11⁰²416-C 515° 11⁰⁸ Off weighed out 80g for D-560-3

D-417

Tung oil & Roisin - melted together.

	Tung oil 50%	Roisin 50%	Tung 100%	Roisin 100%
1				
2	40	60	80	120
3	30	70	60	140
4	20	80	40	160
5	10	90	20	180

all heated to 350° and cooled
 5 is solid - sticky - brittle - pieces pull out
 with fracture like rosin,
 4 is liquid but very stiff.

D-417-B

Blowing Linseed Oil - 1st lot -

90°F started 5 PM 4/29/19 } 7 1/2 lbs Linseed oil (Raw)
 cold stop 7 AM 4/30/19 } 14 hours
 100°F start on 9:15 AM 4/30/19
 220°F at 2:22 PM 4/30/19 sample looked like raw oil no smell
 220°F at 3:20 PM 4/30/19 (30 hours) very light in color, acid odor.
 stop 6:05 PM 4/30/19 cold matter dry (23 hours)
 restart 9:15 AM 5/1/19 small bubbles drifting around
 12:25 PM 5/1/19 stop - 26 hours - Thick as honey
 flows like honey does not form
 drops.

D-418

Blowing Raw Linseed Oil. } Saturday night
 May 31-19

Start 9:15 PM - (220°F approx)
 stop 7:15 AM - June 1st 10 hours,
 start 11:20 AM
 stop 6:40 PM 7 hr 20 min
 after 13 hours cleared up and
 started acid odor,
 after 17 hours bubbles come off.
 Started Monday 8:40 AM.
 off 4:50 PM.
 8 10 min
 25 1/2

A very stiff sell but not
 quite solid like the Native Linseed Co. material
 about 1 hour before solid bubbles stop coming
 off.

D-419-

Blowing fused oil - 5th Batch -

Start 9⁵⁰ PM, June 2nd - 9¹⁰ PM

Stop 7²⁰ AM, June 3 - apparently in danger

Start 7⁵² AM, June 3 -

11⁵⁵ AM. Sharp odor starts - (13⁴⁵ 8²⁰)

3¹⁰ PM. Small bubbles start to come off.
(16²⁵ 23²⁰)

9²⁵ PM - steam off water on - (22⁴ 48²⁰)

8⁴⁵ PM June 4 start -

9¹⁰ PM off - hot. Small bubbles still (23⁴ 23²⁰)

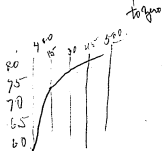
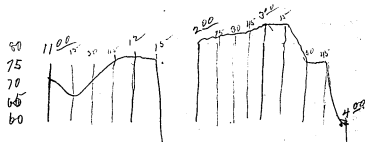
coming off - full of white foam. But

gobs of foam just about stop

from being thrown out, & thick liquid

sublime in bomb -

Steam pressure chart -



D-420
Blowing steam in steam jacket kettle -
Melted room in kettle Steam pressure 75 lbs
Air on 11:27 AM June 4-19

Steam cut off from power plant 12:15 - 1 h gm
heated up and started again 2:22
Stopped splashing up 4:05
Too thick for blowers 8:35 - Cooled to 100°
total time 7 hr 43 min

D-421 Blowing Bonin in
steam jacket mixer, June 5-1919

Blower started 9⁵⁰ Am

stop 12²⁰ PM. Steam pressure too low

started 1⁰⁵

sample out 3¹³ very hot steam 15 lbs

sample out 4²⁵

" off " 10²⁶

off - 11⁰⁰ AM

Steam pressure very variable 50 to 115 lbs

Melting point increased from 186° to 194°

D422 Blowing Lanced Oil
start 9:20 AM May 5 - finish
9:30 AM May 6 - 24th 10th

A little more stiff Jolly than 418

D423 -

Blowing kerosene oil - June 7-19
20 5 gal. lot from Hochengoo.

6.90
13.80
5.90

Start 6:10 PM

at 1:30 PM 7 hours 20 min it
was too thick for air to penetrate -
(thicker than 422) and color
still about the same as when
it started.

got 75 lbs steam pressure
trouble was that Major cut down exhaust, and
Repeat June 9 with same oil

9.20
2.40
16.90
4.40

start 7:20 AM. see 424

1.00
2.00
3.00
16.00

D424 -

Same mixed oil as 423

start 9:20 AM, June 9.

a 8:20 AM sharp smell is very
evident and oil has cleared up.

off at 3:20 AM, 18 hours

start at 9:00 AM June 10 -

off at 12:10

3.10
21.10

D 425
Blowing lined oil -
one gallon "Atlantic" lined oil from
Mr. Glick.
started 2¹⁰ PM June 10-19
at 9-PM oil has cleared
up and gives off very sharp
smell -
stopped at 4:10 PM (14 hours)
Start again at 9¹⁵ PM June 11-19.

D 425
Blowing lined oil
one gallon Atlantic lined oil from
McCluskey
started 2¹⁰ PM June 10-19.
at 9-PM oil has cleared
up and gives off very sharp
smell
stopped at 4¹⁰ PM (14 hours)
Started again at 9¹⁰ PM June 11-19.

weighed out 5000g of resin that
had been melted and strained -

weight 4658g taken from the pot -
not counting several small samples.
6 1/2 % loss

Completely soluble in Benzol
Completely soluble in Heated alcohol.
Completely soluble in Turpentine (a little slower)
About half soluble in Benzine in a gray (dry)
powder is precipitated out when the benzine
readily dissolves large lumps of the resin.

This powder insoluble in Benzine
is completely soluble in Heated alcohol.
When alcohol is evaporated off over steam plate,
a clear resin is left, brittle and sweet like
common Resin, when all alcohol is out but it
is very difficult to get rid of all of the alcohol.

Immedialie

Some has patented a
Shellac Substitute,

Oxide Resin, dissolves
out crystalline part by
Benzol, Petroleum Benzene,
Turpentine. This leaves
the shellac like amorphous
Resin. This is found of
dist by dissolving in
alcohol & filtering

Try it when you
get time -
See D 426

D-426

See 765

Blowing Booin.

Started 4⁴⁵ PM 295°F

Turned off small burner and turned down large burner

4 ⁵⁵ PM	250°F	Turned up gas -
5 ¹⁵ PM	250°F	lighted small burner
5 ²⁵ PM	320°F	
5 ²⁸ PM	330°F	Small burner off
5 ²⁸ PM	320	

3²⁰

9³⁵ PM 3²⁰ No rooin smell at all - very viscous and hard carbon formed over air jets cut off air and gas -

Wt 427 Bochin
Weighd out 5000 g resin from barrel
only 2470.8 left in Kettle -
(about) 30% of abt. 20% of sample to be used

— 50% loss —
distilled off and
probably cracked

Boiled and blown shows by Major night
June 11 at (320°F) M.p. 174°F by L. Ott.
again started melting 9:53 Am June 12 -

Started blowing 10:22	360°F
raised burner ^{only 12 x 6} _{ground glass} 10:26	350°F
10:47	380°F
10:52	395°F
Small burner off 11:00	420°F
11:15	400°F
11:27	386°

Sample at 11:26	11:33	400°	M.p. 185°F
turned down gas a little	11:43	420°	1.2 June 245°F
off	2:04		Thermometer broke -
			about 400-420 to the end

Melting point determined by Bochin on 277°

D428 Resin

5000 g. I resin from barrel -
melted with 500 g. lead peroxide added
slowly in fine portions - stirred each
time an oz. is added until foaming
stops.

Melting point determined by Simpson
172°F
180°F

Melting pt of original resin 148°F determined by Simpson

Weight of resin taken out 5267 g.

D-429
5000 g I Recm M.P. 148°F (Simpson)
Started to melt 10.15 AM June 13-19
Started blowing 10.40 AM ^{25 minutes} 350°F
Sample out 11.40 M.P. 183°F (Simpson)
Sample out 12.00 M.P.
Added 500 g Lead Peroxide - slowly in powder
air off at 12.20 all peroxide in by 12.22 gas off,
gas reduced at 12.20 Temp. went up to
400°F during addition of Lead peroxide
Weight taken out of bottle 4994 g

D430

5000g Protein heated ~~to~~ to about 400°F
and 185 g MnO_2 precipitated added a
little at a time and cooked until all the
slush dissolved.

Weight of protein removed from Kettle 5051g

D431

blowing linseed oil - same oil as
D423-424 - about 2 gallons - all
the pot will hold when frame is highest.
Started blowing 10.50 AM June 16-19
stopped at 12.00 Midnight. 13¹/₂ 10 =
started again 8.40 AM June 17
off 12.40 PM " Solid 4¹/₂

17¹/₂ 10 =

D-432

5000 g IRosin from barrel

300 g Manganese dioxide powder.
(ground pyrolusite)

cooked until black all dissolves
leaving ^{or} Brown transparent rosin
(about 400°F for about 30 min)

B-433

June 17-19

5000 g I Rosin -

500 g Manganese dioxide powder
about 80% MnO₂ ground Pyrolutite

Rosin melted -

and MnO₂ added very slowly about
1/2 hour required - last ounce
of MnO₂ caused the mass to
solidify to wax like consistency.Taken out of pot 4939 g lumps
small enough for m.p. test
and samples -2nd lot started July 9-19 ~~1919~~Melted rosin with both burners and
stirred very little.

all melted - started to add Pyrolutite 10 50

all pyrolutite in 10 52

mixture solid 11 27

5080 g mass of lumps with

turned off burners and put can
of water under to cool -

(No 630)

Daily mix - June 20

4250 clay -

1264 Binder

380 Floe -

93 g as slack

5987

~~5987~~

~~4250 clay
1264 Binder
380 Floe
93 g as slack
5987~~

70% clay

24% Binder

6% Floe

1% g as slack

D434

5000g Roisin from Borel

400g Manganese Dioxide Powder
Same as used in D433 (80%)

7500 g Roisin

600 g Manganese Dioxide

Went solid in pot same as D433 -

40 g ^{added} ~~added~~ ^{after} ~~after~~ ^{with} ~~with~~ roisin melted
and, manganese started - only
large burner after 10 minutes.

this is $\frac{4}{5}$ as strong in
turnover as D433

7.550 g put in

7.613 g taken from pot

237 g lost.

D435

June 25-19

5000g rosin

300g

-(6%) Ground pyrolysis

Same as used in 433-44

4891g taken from pot.

8436

4.56% of 80% MnO_2 = same oxygen
content as 10% of pure lead peroxide —

5000 g. Moim —

230 g. ground Pyrolusite.

5015 g. taken from pot

$\frac{455}{237.5}$

D 437
200 g Raw linseed oil -
10 g ground Pyrolytic,

heated in small amount -
apparently no combination below 500°F

3rd lot } 10000g Rosin
July 14-19 } 700g Pyrolysate,
must solid in pot -

D438
5000g Rosin
350g 7% Ground Pyrolysate Rosin
so called in 433-4

Melted Rosin - temp around 400°
added Pyrolysate, heated until
all dissolved then ran temp up from
460° to over 500° for 15 minutes,
Made by Simpson July 1-19 -

Rosin taken out of pot (4357g)
(2nd lot) taken out of pot (4310g)

D-439
 one gallon (7½ lbs) raw linseed oil
 still blows 5.10 } then on about 220°F
 off $\frac{10.20}{5 \text{ to } 10 \text{ min}}$

This oil will take up HNO_3 at 350°F
 about the same as keros. but raw oil
 takes up very little HNO_3 even at 500°F.

D440

Blowing finished oil -
(one gallon) $7\frac{1}{2}$ lbs raw oil, 80% ^{finest} ~~about~~
30 g about 1% of Pyrolinite,
Started 2:30 PM July 7-19

4:45 PM Very sharp odor
7:55 AM July 8 off

17^h 25^m

Pyrolinite apparently has no effect.

D441

Blowing Linseed oil -
7 1/2 lbs Row linseed oil,

1009 D433 Row
300 8 D429 Row

(Mass)
(P.D.)

Started blowing 3 PM July 8
added Resinates 3 10

finished 3 20 PM July 9

12 20

about same as without driers but
surface is less sticky after short exposure
to air, color is very dark red -

D442 - See 443

Blowing Linseed Oil -
7 1/2 lbs. Raw oil -

200 g Prussian Blue -

I heated to about 500°F in copper pot
added the Blue - - Only a small
amount of the Blue combined the
rest settled out, later -

Poured thru cheesecloth into the
blowing kettle.

Started blowing 2:15 PM July 9 -
Does not foam like the raw oil.

Sold 1:20 PM July 10
2:03 hours

D443

7 1/2 lbs Raw/pressed oil,
heated to 500° F. and the prussian
blue (10 g.) previously ground in
about a pint of the oil is poured
in and the oil heated until no blue
color shows.

Started blowing July 10. 3 pm
no foam at all on the pot -
power off for about 3 hours
and finished about 5 pm July 11-19

D444 Oil -

$7\frac{1}{2}$ lbs. kerosene oil -
30 g. prussian blue ground twice
in 7 parts of the weighed oil then
stirred into all of the oil in copper kettle
cold - heated to 550°F -

Put in Blowing kettle and started
to blow at 12¹⁰ PM. July 14-19 -
Very thick nearly solid 8⁴⁵ PM.

Solid 9⁰⁵ - Steam off
cooled with water
Time 8⁵⁵ PM

The blowing tube holes were all
thoroughly cleaned out with drill for this
experiment. #42-443 were made with
holes partly plugged with oxidized oil,

D445 oil — (rec 444)

7 1/2 lbs linseed oil.

6 g Prussian Blue —

Prussian blue ground in one pint
of the oil and then stirred in the
whole — heated to 550°F 375°-550°
in 35 minutes, stand with flame
lowered temp down to 540° in 5 min
then off.

Steam on blowing bottle. poured in
and started air 3¹² PM July 15-19

very thick 10 PM

Solid — except by Major 4 PM —
temp 124 50 m

6 lbs 15 oz taken out —

5 g skins etc from side of

7 4 g pot — bracke —

about 4 g lost

D446
7 1/2 lbs Menhaden Fish oil - white blend
put in blowing kettle and started
with steam on low pressure
start 10³⁰ - run July 16-19
July 17 power off about 4 o'clock
for about 2 hours -
Steam off and stop about
1, 20. pm -
Solid and very little fish oil
smell

D 447

Blowing Menhaden Fish Oil -

7 1/2 lbs Oil

100 g D433 Porim (MNO₂)

300 g D429 Porim (PBO₂)

Starts 9:00 PM July 17-19

8:05 AM July 18 Fresh solid.

At 10:05 AM July 18 Solid -

4/21

D - 448

Blowing Raw Lined Oil.

7 1/2 lbs. started in copper pot 12:30 PM
7:41 PM rising in temp. to 550° F and
allowed to remain at that temp. for
half hour at which time it was
poured into blowing pot. Heat on ~~on~~
Blown till noon Sunday at which
time it was turned off by Katchew.
Started again. 8:30 AM Monday.
+ Began to get solid 3 AM Sunday +
9 AM bubbles coming off - acid over.
10:30 AM - very nearly solid.
11:15 AM - Thoroughly solid - Time 25 3/4 hrs.
wt of oil blown — 6 13/16 lbs.

412
D-449

7 1/2 lbs plain raw linseed oil
put in blousing kettle, steam on full
pressure cracked, temperature readings
hourly:

started 2 Pm 7/21
4 Pm - 300° - beginning of color change.
5 - 290° - More color.
6 -
7 -
8 -
9 -
10 -
11 - Practically solid.
12 -

1
2
Running time off 10 hrs. wt. 6 1/6 lbs

443

D - 450

① First experiment - Col. red.

Cylinder

② $\frac{1}{2}$ lbs oil started 9:00 AM
 Temp 140° - Started to add P₈₀₂ in (log) 9:25.
 While stirring this a greenish yellow foam
 formed on the top.

310° All foaming ceased - apparently almost ~~434~~

320° Started adding P₈₀₂ 9:45

335° All in 10:00

480 Two burns 10:15

480° Approx. held till 10:45

Color - Brownish red. 10:45

360° Held 10:45

Low pressure 5 lb

310° - Foam considerably - blanching vapor

Foaming ceased - nitric acid 11:30

230° 12:00

230° Acid also gone - 1:15 PM

Got-like liquid oil acid odor 3 PM

Practically solid 4 "

Relieved to run till 5

Dark brown in color, very sticky, ~~5~~

(19)

4/24

D-451

Pinched Oil and PbO_2

7 1/2 lbs raw linseed. Oil and 25g PbO_2 heated together in copper pot

Oil started heating

320° Started adding PbO_2

470° All PbO_2 in

480° Appx. held till

started blowing

240° Acid odor lost

220° No physical change

getting thick at bottom

5:15

12:00 PM

1:50

2:10

2:40

3:10

4:00

5:10

8:00

9:45

4/25

D- 452

Linsseed oil and varnish mixed
litharg.

7 1/2 lbs raw linsseed oil and 25g
litharg heated together in copper
pot.

	Oil started heating -	9 ³⁰ AM
340°	Started to add litharg	9 ³⁵
350°	All in.	9 ⁴⁵
500°		10 ⁰⁵
490°	Above till	10 ²⁵
240°	Started blowing (dirty brown color)	11 ¹⁵
260°		1 ¹⁵
	Solid	2 ¹⁵
	Allowed to blow 'till	4 ⁰⁰

Low pressure steam was used.

4/28/19

II - 453

7 1/2 lbs raw linseed oil
 12 1/2 g - Szechang.
 12 1/2 g - Red lead.

Started in coppr pot -
 320° Began to add litharg. -
 360 " " red lead -
 410 All in.
 500
 510 Held for 1/2 hr.

10⁵⁵ AM
 10⁴⁴ AM
 10¹⁴
 10⁰³
 10³⁸
 10⁵⁸

320° Started blowing
 340 Acid odor turns rfr
 230 No physical change
 235 "
 220 Slightly Thickened - bubbles
 230 More thick -
 Thick and blubbery
 Air just blowing thru

11⁰⁰
 12⁰⁵
 1⁰⁰ PM
 2⁰⁰
 3⁰⁰
 4⁰⁰
 5⁰⁰
 6⁰⁰

D-454

7/29/19

7 1/2 lbs. raw linseed oil
25 g - red lead.

Started in copper pot
310° Began to add lead
350° All in
500° Reached at
500-510 maintained till

1:50 PM
3:00
3:07
3:12
3:42

Started blowing (low pressure)
240° Acid odor

3:45
4:45

D 455

D 455 Viscous Clays, etc -

- 1 200 Mesh Mica Flowl. Amer. Mica Co. Canton Pa.
- 2 Mica Substitute, H. P. Binswanger 203 Broadway N.Y.
- 3 A. Tale. Tale Products Co. New York.
- 4 (Asbestine etc) Charles A. Wagoner "S" 221 N. Front St. Phila.
- 5 (Asbestine etc) Samuel Nevins Co. (43 clay) 109 S. Second St. Phila.
- 6 (Asbestine etc) St. Lawrence Tale Co. (Tale clay) 7 E 42nd St. New York
- 7 (Terra Alba) Katzentach & Buelloch Co. T.B. White Clay 100 William, N.Y.
- 8 (Terra Alba) Coxall Chemical & Supply Co. (G.S. 2)
- 9 (Terra Alba) Innes Spicden Co. Inc (Clay) 41 Cliff St. N.Y.
- 10 (Terra Alba) Paper Makers Chemical Co. Easton, Pa. (Refined)
- 11 (coarse clay) Harris Clay Co. (Spruce pine clay) II. N.boro, N.C.
- 12 (coarse clay) Newark China Clay Co. (No 2 China clay) Wilmington Del.
- 13 (coarse clay) " " " (Kale Powder) " "
- 14 (coarse flake) C.K. Williams & Co. Easton Pa. (G.V. Ball Clay)
- 15 (fine flake) John Richardson Co. Box 2397 Boston Mass. (G. P.) Engle
- 16 (coarse flake) Coxall Chemical Supply Co. (G.S. 7)
- 17 (coarse flake) " " " (G.S. 9)
- 18 (coarse flake) J. C. Bucher. Boiling Springs, Pa.
- 19 (coarse flake) Mines Edgar & (T.B. clay) 30 Church St.
- 20 (coarse flake) Coxall Chem Supply Co. East Liverpool Ohio. (GSK)

- \$2.10 per ton. Canton Pa.
 \$2.80 per ton \$6.50 out freight.
 \$10.00 per ton. Mined at Glendon N.C.
 18.00 " " "
 16.00 " " "
 12.00 " " " Mined at Natural bridge, ~~N.Y.~~ N.Y.
 18.75 " " " " " " " " " " " "
- 50.00 per ton
 15.00 " " " mined at Spruce pine, N.C.
 16.00 " " " " Thompson, Del.
 17.00 " " " " " " " "
 45.00 " " " " " " " "
 14.54 " " " ex ship.

undveloped
 10.00 per ton Mac Intyre, Pa.

D456

Coarse clays. (X 9 contains colloid)

1. Pearl Kaolin Co., Box 41 Chester, Pa.
2. G. Golding Sons Co., Hochessin, Del. (Golding China Clay)
3. Columbia Kaolin & Aluminum Co., Washington D.C.
4. Moore & Mongar, 29 Bidway, N.Y. (New Altham washed Dometic)
5. B.F. Drakenfeld, 50 Murray St, N.Y. ("D" Powdered China Clay)
6. T. Poole Maynard, 226 Hurt Building, Atlanta, Ga.
7. John W. Higman Co., New York. (G.S. English China Clay)
8. Joshua Poole, East Liverpool, Ohio. (No 4)
9. Rosales & Haselach Chem. Co., New York. ("O" clay)
10. John W. Higman Co., N.Y. (Potting "MW" English China clay)
11. John Richardson Co., 201 Almonshire St. Boston. (X30) Potting.
12. Star Clay Co., Montebria, Pa. (Powdered China Clay)
13. L. A. Salmonson Box 216 Pearl St., N.Y.
14. Moore & Mongar, N.Y. (MAM English China Clay)
15. C. B. Chrystal, N.Y. (A. Powdered Clay)
16. B.F. Drakenfeld, N.Y. (L. China Clay Powdered)
17. Stanley Daggett Inc., 99 John St., N.Y. (B. Clay)
18. John Richardson Co., Boston. (C.F.) Potting.
19. Hartschaw Fuller & Goodwin Co., N.Y. (Highland, Baked English)
20. John W. Higman Co., N.Y. (IX English China clay)

\$12.00 per ton Stanton Del. (X 9, see 17 in clay body)
 \$5.50 per ton mined at Hochessin, Del.
 \$10.00 " " " " Gordon, Ga.
 \$11.00 " " " " in Georgia.
 \$35.00 " " F.O.B. New York.
 \$18.00 " " F.O.B. New York.
 \$23.75 " " mined in Florida. (contains much colloid)
 \$16.00 " "
 \$15.00 " "
 \$15.00 " "
 \$15.00 " "
 \$20.00 " "
 \$45.00 per ton F.O.B. New York.
 \$17.25 " "
 \$35.00 " " F.O.B. Cars in Pennsylvania.
 \$18.00 " "

D 45-7

Clays - ~~are~~ a little too coarse - possibly OK.

- 1 John Richardson etc. (Box 2897 - Boston) (#247)
- 2 Whitaker Clark Daniels Westport. (#34 clay)
- 3 H. P. Binswanger, 203 Cedar, N.Y. (Pebb. English Marl.)
- 4 John W. Higman Co. N.Y. (Pulverized English China Clay)
- 5 John W. Higman Co. N.Y. (English China clay.)
- 6 Croxall Chemical & Supply Co. G.S. 4.
- 7 T. Poole Maynard P.H. II. Atlanta, Ga. (No 2 Clay)
- 8 R.T. Vandarbilt Co., 50 E 42nd St. N.Y. (Shamrock Pebb. clay.)
- 9 C.K. Williams Co., Easton, Pa. (Immaculate powdered clay)
- 10 Chas. A. Wagner, 221 N. Mont St. Phila. Pa. (Snowflake)
- 11 Dixie Brick & Tile Co., Forsyear, Tenn. (Clay No 1)
- 12 Roswell & Hazard Bros. Chem. Co. N.Y. ("G.W" clay)
- 13 Chas. M. Franzheim Co., City Bldg Bldg, Washing D.C. (#30 English CC)
- 14 Joshua Poole, East Liverpool, Ohio. (No 1)
- 15 S.C. Lyon & Bros, Bennington, Vermont. (China Clay)
- 16 Miner-Edgar Co. 30nd St. N.Y. S.C. Powdered Clay)
- 17 Rosser & Hassbacher Co. 100 William St, N.Y. ("S.C." Clay)
- 18 Hammill & Co. Despie. 240 Ford St. N.Y. (Gotta Lee Moon CC)
- 19 J. Lee Smith Co., N.Y. Q.B. S. English China Clay.
- 20 Samuel Nevins Co. East. 107 S. 2nd St. Phila. #45 clay

\$19⁷⁸ per ton.

~~\$~~ 40⁰⁰ per ton.

1700 per ton.

#1500 Saylorsburg, Pa -

#1600 Langley, S.C.

~~27~~ 50

\$4.00 per ton Puryear, Tenn.

~~8000~~ per ton.

\$17.25 per long ton F.O.B. Cars New York.

2500 " " " " " "

\$1400 per ton McIntyre, Ga.

1350 " " Mined in South Carolina.

#5500 " " "

#1700 Per ton

dry -

dry

dry

unctions

dry

Clays About like what we use -

- 1 L. B. Carey, Rome Ga. (No 5 Pink China clay.)
- 2 Albion Kaolin Co., Hepzibah, Ga.
- 3 Joshua Poole, East Liverpool, Ohio. (No 10)
- 4 Miner-Edgar Co., 30 Church St, N.Y. (B. W. Clay)
- 5 Holly Clay Corp., Real Estate Trust Bldg., Phila. (Washed clay.)
- 6 Stahl & Hoggatt, Inc. (A. Clay)
- 7 Paper Makers Chemical Co., Easton, Pa. (X1 Georgia)
- 8 Moore & Mungar, New York. (Paramount American Grude)
- 9 Philadelphia Clay Co. Phila., Pa. (Lump American China Clay)
- 10 Whiteaker Chemical, Haverhill, N.Y. (Clay No 37)
- 11 Frederick E. Bausch, 1105 Chemical Bldg., St. Louis.
- 12 Tressler & Haselacher Chem. Co., N.Y. (W. Clay)
- 13 Philadelphia Clay Co., Phila. Pa. (Refined Amer. China Clay)
- 14 Robert Grilchiet, 82 Canal St, N.Y. (Anglo Amer. Talk, Corp.)
- 15 L. B. Carey, Rome, Ga. (No 4 White China Clay)
- 16 T. Poole Maynard, 222 Hunt Bldg., Atlanta Ga. No 3 clay.
- 17 John W. Hageman Co., N.Y. (J.W. English China Clay)
- 18 Hammill & Gillespie, N.Y. XXX Imported
- 19 Paper Makers Chemical Co., Easton, Pa. (No 70 Clay)
- 20 John Richardson Co. Box 2887, Boston. (G.Z.B. English China Clay)

\$7.00 per ton Hepzibah, Ga.
 \$24.00 per long ton F.O.B. New York.
 \$10.00 per ton McIntyre, Ga.
 \$12.00 " Mt Holly Spgs. Pa.

\$8.50 per ton
 \$8.00 Mines in Georgia.
 \$11.00 Mines Toland, Pa.

unctious
dry

\$5.00 ton. N.Y.
 \$1.30 Mines Toland Pa.
 \$2.10 per ton in paper bags F.O.B. Orange, N.J.

feels fine,
feels coarse.

unctious.

\$20.00 per ton.
 \$21.00 " " N.Y.
 \$19.50 " " N.Y.
 \$8.00 " " N.Y.

unctious.

Clays about like what we see and find -

- 1 Monarch Clay Mining Co., Bellvue Ky. Tongue Spring Ball Clay
- 2 Paper Makers Chemical Co., Easton, Pa. #2 Refined
- 3 Aluminium Flake Co., Akron, Ohio.
- 4 Ghas-M-Kang-Heim Co. Wheeling, W. Va. Interstate Clay Co. Sumter, S.C.
- 5 Savannah Kaolin Co., Gordon, Ga. (Washed white clay)
- 6 Parsons & Whittemore Inc., 299 Broadway, N.Y. (No 1 McNamee China Clay)
- 7 Miner-Edgar Co., 52 Warren St., N.Y. (E.W.N. Finesd Clay)
- 8 John W. Higman Co., 37 Broadway, N.Y. (No 45 Domestic China Clay)
- 9 T. Pade Maynard, 226 Hunt Bldg., Atlanta, Ga. (Clay No 1)
- 10 Robert Gilchrist & Co., 82 Beaver St., N.Y. Argilliferous Lile Gr. pr.
- 11 National Sales Co., Cincinnati, Ohio. #290 Clay.
- 12 Parsons & Whittemore Inc., 299 Broadway, N.Y. (X1 Pulverized Clay)
- 13 Stevens-Reiter & Hancock Inc., 125 S. Wabash Ave., Chicago. (X126 Clay)
- 14 H.S. Grossman, 39 Cortlandt St., N.Y. (Washed No 45)
- 15 A. Kleipstein Co., N.Y. (China clay)
- 16 H.P. Binswanger, 203 Broadway, N.Y. (To Vaseg'd Domestic Kaolin)
- 17 Paper Makers Chemical Co., Easton, Pa. (Refined No 1)
- 18 Hamill & Riospie 240-2 Front St., N.Y. (A-1 Imported)
- 19 Whitaker, Clark & Daniels, N.Y. (Clay No 41)
- 20 John W. Higman Co., 37 Broadway, N.Y. (Superb Crude Domestic)

- #5.50 per ton Paris, Tenn.
 #8.50 " " Langley S.C. in paper bags.
 #2.50 per ton Bardsen, Ohio. dry.
 #10.00 per ton (Korolb) Congaree S.C. Quoted as by John W. Higman
 #10.00 per ton Gordon, Ga.
 #8.00 " " Bath S.C.
 #10.00 per ton Congaree S.C.
 21.00 per ton #06 Orange N.Y. Dec'D 458-14
 #11.00 per ton S.O. b. Steadman, S.C. bags 18 lb. ea.
 #9.25 per ton Bath S.C.
 #10.25 " " Langley S.C.
 #12.00 per ton S.O. b. Summit, S.C.
 #25.00 per ton New York
 #12.50 " " paper bags 25 lb Freight est. 60
 #12.50 " " Langley S.C.
 #23.50 " " New York.
 8.00 per ton Hepzibah, Ga. Unctious

Fine crude clays - colloidal particles not washed out.

- | | | | |
|-----------------------------------------------------------------------------|---------|--------------------------------------|------------------|
| 1 John Smith & Sons Company, East Liverpool, Ohio. (X1 Pure. Georgia) | \$8.00 | Pey Branch, Ga. | unctious |
| 2 T. Poole Maynard, 226 Hurt Bldg, Atlanta Ga. (No 1 Clay) | | | dry |
| 3 J. P. Pratt, Woodbridge, N.J. (X1 Fine clay.) | | | unctious |
| 4 Miner-Edgar Co., 300 Church St. (L.C. Clay) "washed up" | \$10.00 | Akka Humphreys, Fla. | unctious |
| 5 Lake County Clay Co., Matthes, N.Y. ("Lake County" Clay) | \$8.00 | Edgar, Fla. | unctious |
| 6 H. S. Grossman, 39 Cortlandt St. N.Y. (Mindel Products Co. Georgia. Buck) | \$10.10 | Oglethorpe, Ga. (See (18) clay bank) | unctious |
| 7 Edgar Plastic Kaolin Co., Metuchen, N.J. (Edgar Clay) | \$10.00 | Edgar, Fla. | unctious |
| 8 Papermakers Chemical Co., Easton, Pa. (Lump Florida) | \$10.00 | Oka Humphreys Fla. | |
| 9 Parsons & Whittemore, 299 Broadway, N.Y. ("M.N.W. China clay") | \$6.00 | Bath, S.C. | unctious |
| 10 Colonial Clay Co., Paducah Ky. | \$3.00 | Hickory Ky. | |
| 11 Joe A. & W. E. Hill, Abbeville, S.C. (X1 G.) (In lumps in paper bag) | \$15.00 | Woodrow, N.C. (in filter press cake) | unctious |
| 12 Hand Clay Co., Gaston, N.C. ("Sprucepine Hand clay") | \$4.00 | Trenton, N.J. | unctious |
| 13 C. B. & S. C. Co. Hazel, Ky. (No 9 B.C.) | \$4.50 | Trenton N.J. | unctious |
| 14 Moon Clay & Kaolin Co., Trenton N.J. (No 2 Sagger) | \$3.75 | For Trenton. | unctious |
| 15 Moon Clay & Kaolin Co., Trenton N.J. (No 1 Sagger) | \$6.50 | Pawtucket, Md. | unctious |
| 16 Consolidated Clay Co., 100 State St., Trenton. | \$7.00 | Winton Woodbridge N.J. | unctious |
| 17 Victor G. Bloede Co., Balto, Md. Red clay - | \$6.00 | Perth Amboy, N.J. | unctious |
| 18 Estate W. H. Cutter, Woodbridge, N.J. (X1 Retort Clay) | \$7.50 | Lincoln, Cal. | unctious & grit. |
| 19 L. A. McHose Inc., Perth Amboy, N.J. (Fine blue) | | | |
| 20 Gladding, McBean & Co., San Francisco, Cal. (Ground Fire Clay) | | | |

II-461 - Fine crude clays.

- 1 C.B. & S.C. Co., Hazel, Ky. (#10 B.C.)
- 2 W.H. Gutter, Woodbridge, N.J. (#1 Fine Clay)
- 3 J.P. Prall, Woodbridge, N.J. (Deep buff clay)
- 4 Dixie Brick & Tile Co., Puryear, Tenn. (Clay #2)
- 5 Armstrong Gork Co., Beaver Falls, Pa.
- 6 Paducah Clay Co., Paducah, Ky. (Lofton, No. 1)
- 7 Monarch Clay Mining Co., Bellevue, Ky. (Jernigan Sagger)
- 8 The Crossley Mining Co., Toms River, N.J. (#3 clay)
- 9 Jas. P. Prall, Woodbridge, N.J. (#1 Sagger Clay)
- 10 L.A. McHose Inc., Perth Amboy, N.J. (#7)
- 11 Kern Commercial Co., N.Y. (Imported Gracilic)
- 12 Enterprise White Clay Co., Real Estate Trust Bldg., Phila. (Mayfield No. 2 Ky. Ball clay)
- 13 Mayfield Clay Co., Mayfield Ky. (No. 2 Ball clay)
- 14 Monarch Clay Mining Co., Bellevue, Ky. (Jernigan Gray Ball)
- 15 Moon Clay & Hardin Co., Trenton, N.J. (No. 2 Sagger) (Chocolate clay)
- 16 Mayfield Clay Co., Mayfield, Ky. (#1 Clay)
- 17 Monarch Clay Mining Co., Bellevue, Ky. (Jernigan Sagger) (Pomona marble)
- 18 Paducah Clay Co., Paducah Ky. (Howard No. 1 clay)
- 19 Paducah Clay Co., Paducah Ky. (W.S. Clay)
- 20 Foster, Verner & Rice, Tuscaloosa, Alabama,

colloid particles not washed out, mostly colloid.

800 per ton - Woodbridge, N.J.

motion

motion

dry

motion

motion

motion

motion

motion

motion

motion

dry

motion

dry

motion

motion

motion

motion

motion

dry

motion

\$5.00 per ton - Puryear, Tenn.

\$3.50 per ton - Beaver Falls, Pa.

\$3.00 per ton - Paducah, Ky.

300 per ton - Bellevue, Ky.

\$3.00 per ton - Toms River.

\$4.25 per ton - Perth Amboy.

about \$2.25 per ton - N.Y.

\$5.50 per ton at mines. (Mayfield Ky.)

\$4.00 per ton (Mayfield Ky.)

\$5.00 per ton - Paris, Tenn.

\$4.00 " " Trenton, N.J.

300 per ton Mayfield Ky.

300 per ton Paris, Tenn.

300 per ton F.C.B. Benton Ky.

\$2.00 " " S.C.B. " "

Underdeveloped.

II-462 Fine Crude Clays.

- 1 F.T. Carmack, Burnsville, Miss.
- 2 Product Sales Co., 32 S. Calwist St., Baltimore (Berkeley Clay)
- 3 H.S. Crossman, 39 Cortlandt St., N.Y. (Crude Alabama C.E.)
- 4 Monarch Clay Mining Co., Bellevue, Ky. (Clay gray ball)
- 5 W^o Gamley, New Castle, Colo.
- 6 Jas. P. Pratt, Woodbridge, N.J. (Irony Fine)
- 7 Grimora Manganese Gorp, Grimora, Va. (Clay) buff.
- 8 Grimora Manganese Gorp, Grimora, Va. (Clay) Red.
- * 9 J.A. Jeffe, Rockland, Mich.
- 10 Moon Clay & Kaolin Co., Trenton, N.J. (Shady Red) Red
- 11 H.N. Cooper, Hollow Rock, Tenn.
- 12 Empire Clay Mining Co., 53 Residences St., Albany, N.Y. Albany Silica
- 13 Jackson Bros. Clay Mining Co., Paris, Tenn. (Hornsho)
- 14 Enterprise White Clay Co., Fla. (X30 grade plastic clay)
- 15 J.P. Pratt, Woodbridge, N.J. (Tough blue)
- 16 Kern Commercial Co., New York, (disrupted crucible clay)
- 17 Mayfield Clay Co., Mayfield, Ky. (X3 Ball clay)
- 18 Monarch Clay Mining Co., Bellevue, Ky. (Grabbie Black)
- 19 J.F. Morlen, Trenton, N.J. (Rockingham Clay)
- 20 W^o Hinwiddle, Metuchen, N.J.

BLACK

- \$8.00 per ton Cold Springs, Va.
 \$7.50 " " Allen, Ala. unctious
 \$5.50 per ton F.O.B. Paris Tenn. unctious
 \$4.00 per ton New Castle, Colo. looks like V. Hard unctious
 no quotation. dry
 550 per ton Rob. Rockland Mich. soft fine
 (\$3.25 per ton) Trenton. unctious
 (\$1.50 per ton) dry
 \$4.00 per ton F.O.B. Albany. unctious
 \$6.00 & \$8.00 per ton dry
 \$3.50 per ton F.O.B. mine in N.J. unctious
 about \$2.00 per ton New York. unctious
 \$5.00 per ton Mayfield Ky. unctious
 \$5.50 Paris Tenn. unctious
 \$4.25 per ton Trenton. unctious
 \$3.00 per ton - F.O.B. Metuchen N.J. unctious

II-463

Cude Gritty Clays, white to gray

- 1 J.A. & Wm E. Hill, Abbeville S.C. (Loose in box with MC)
- 2 Paper Makers Chemical Co. Easton, Pa. (X72 clay supports)
- 3 Jas. A. & Wm E. Hill, Abbeville, S.C. (X A)
- 4 A.B. Lehman, Fayetteville, Pa.
- 5 A.H. Mackay, 120 Pearl St., N.Y.
- 6 Kelson & Co. Bullbrook 100 W. 5th St. N.Y. (X 10 white clay)
- 7 Golding Sons Co., Butler, Ga. (Georgia Clay)
- 8 Barr Tile Works, Aspers, Pa.
- 9 Victor G. B. Cede Co., Fading Road Sta. Belts, Md. white clay
- 10 Atlas Mineral Products Co., Lincoln, N.J. (M Clay)
- 11 Foster Mineral Co., Phila. (Finely powdered Ary Branch Clay)
- 12 Jas. S. Maffitt, Perryville, Md. (washed by hand)
- 13 Amcas B. Lehman, Fayetteville, Pa.
- 14 Natl Clay Refining Co. Shamock Station Pa (320 W Clay)
- 15 Western Mason Co., 4101 Olive St. St. Louis, Mo.
- 16 Will Grossett & Co. (Bowl China Clay)
- 17 Atlas Mineral Products Co., Lincoln, N.J. (R Clay)
- 18 The Barr Co., Norton Pa.
- 19 Lester Clay Co., Jacksonville, Fla. Fuller's Earth
- 20 Ostrander Fire Brick Co., Troy, N.Y.

\$1.50 per ton New York,

like fuller's earth

like fuller's earth.

Mine not developed.

\$3.00 per ton, Georgia.

\$17.00 per ton S.C.

\$7.00 per ton mined at Butler Ga.

\$5.00 " " Aspers Pa. like fuller's earth

\$3.00 " " Fawcett, Md.

\$4.50 " " Merztown, Pa.

like fuller's earth

like fuller's earth.

Mine not developed

Mine not operating negotiation.

\$4.00 per ton F.O.B. Shamock, Pa.

Mine per ton F.O.B. G. & S. Allen, Mo.

like fuller's earth

\$9.00 per ton Merztown, Pa.

3.00 per ton Norton, Pa.

\$12.00 per ton Alta paigus, Ga.

like fuller's earth.

fuller's earth.

like fuller's earth.

II-464

Crude gritty clays. gray to black.

- 1 Monarch Clay Mining Co., Pullman, Ky. (Bowden load)
- 2 Ostrander Fire Brick Co., Troy, N.Y. ("E")
- 3 Ostrander Fire Brick Co., Troy, N.Y. ("A")
- 4 L.A. McHase Inc., Perth Amboy, N.J. (Star Blue)
- 5 W.H. Culver Estate, Woodbridge, N.J. ? (X1 Retort)
- 6 " " " ?
- 7 Crossley Mining Co., Crossley Station, Toms River, N.J. X2 Clay
- x 8 J.P. Reid, Woodbridge, N.J. (Boff clay)
- x 9 J.F. Morton, Trenton, N.J. ("F" clay)
- 10 L.A. McHase Inc., Perth Amboy, N.J. ("G" Retort)
- 11 Geo. S. Mopham & Co., East St. Louis, Ill. (X7 Gray Clay)
- xx 12 National Sales Co., Cincinnati, Ohio. (X301 Clay)
- x 13 James P. Prall, Woodbridge, N.J. (gray sandy)
- 14 Jas. W. Gollins, 402 Frick Bldg., Pittsburgh, Pa.
- 15 L. B. Garey, Rome, Ga. (No 2)
- 16 L. B. Garey, Rome, Ga. (Clay X3)
- o 17 C. K. Williams & Co., Easton, Pa. (X1045 Pigment) (Red)
- 18 L.A. McHase Inc., Perth Amboy, N.J. (Red)
- x 19 Cherokee Ochre Co., Cartersville, Ga.
- 20 L.A. McHase Inc., Perth Amboy, N.J. (Black Retort Clay)

\$3.00 per ton F.D.B., Paris Tenn.
 \$2.50 per ton 506 Perth Amboy, N.J.
 4.00 per ton " " " "
 5.50 per ton " " " "
 \$7.50 per ton Woodbridge, N.J.

\$3.00 per ton Toms River, N.J.

4.00 per ton Trenton -
 \$4.50 per ton Perth Amboy, N.J.
 \$1.00 " " East St. Louis, Ill.
 \$4.00 " " Newnan Ga.

No quotation.

Coarse grit - like stone -

\$32.00 per ton delivered.
 \$330 per ton Perth Amboy, N.J.
 \$4.20 per ton Perth Amboy, N.J.

D465-
 100% H. Schulte clay, what we are using, separated
 by flotation in three parts -
 100g total - $\left\{ \begin{array}{l} 77.5 \text{ v. fine.} \\ 16.6 \text{ fine.} \\ 4 \text{ coarse} \end{array} \right.$

 worked out and lost - $\begin{array}{r} 94.5 \\ 5.5 \text{ colloidal} \\ \hline 100.0\% \end{array}$

Same test on lion clay -
 100g total $\begin{array}{r} 37.6 \text{ v. fine} \\ 39.3 \text{ fine.} \\ 12.3 \text{ coarse.} \\ \hline 89.2 \\ 10.8 \text{ colloidal} \\ \hline 100.0 \end{array}$

D466 Nozin

5000g (11 lbs) Nozin.

200g Pyrochroite.

200g Litharge.

Melt Nozin, when temperature
is about 400°F add pyrochroite
and litharge slowly -
then bring temp to 500° and
hold for 15-min.

D467

Blowing Castor Oil,

7 1/2 lbs Castor oil -

Steam on cracks, exhaust open
full about 220°F.

Started blow 952 AM Oct 28-19.

5 PM Oct 29 put steam on full and
only cracked the exhaust,

1130 AM solid -

30" 30" high temp.

31" 10" at 220°F

61" 40" total time blowing

very tough sticky masses.

Clay from P. T. Vanderbilt Co.,
K. Georgia .260
Rivale .241
Blue Ridge .252

Tested By R. Lee

June 18

628

10.53 Del rosine cotton
5 min

11 $\frac{1}{3}$ chalk 5-

11.5 $\frac{1}{3}$ chalk 5-

11.10 $\frac{1}{3}$ chalk 15-

11.25 Sup. heater 45-

~~out~~
12.10 out

grind
1 hour

June 19

629

11 Oil resin Cotton

Sulfuric 5 min

11 5 $\frac{1}{2}$ Chalk 5

11 10 $\frac{1}{2}$ Chalk 5

11 15 $\frac{1}{2}$ Chalk 30

11 46 out

Grind 1 hour

9 3 out the oil

5/12

Weight - resin

14939

[ITEM(S) FOUND IN BOOK]

Sept 4

12	Oil Resin Collor	
5-	Cut - +	
10	$\frac{1}{2}$ Cut - Clay	
15-	Cut - +	
20	$\frac{1}{2}$ Cut - Clay	
25-	Cut - +	
30	+ Cut - $\frac{1}{2}$ Clay	
35-	Cut - +	
40	Cut - +	
1 60	Cut - +	
12	35- Thermometer	334
11	40	338
11	45	344
11	50	346
11	55	350
1	60 35-6	1.20 out as high 360

[ITEM(S) FOUND IN BOOK]

good	V good	W good
239 Zinc white		223
	246-2 blue size	246-3 - blue size
	248 " "	
250 blue size & good black	256 " "	
259 blue size		271 Red lead.
274 Litharge		272 Lead chromate.
280 Lead chromate.		

[ITEM(S) FOUND IN BOOK]

$$\begin{array}{r} 2525 \\ 175 \overline{) 2525} \end{array}$$
 Alcohol

Andromeda Resin 2.16 g.
 Para 2 g.
 Alcohol 525 g.

Solution for
 three lots, $\frac{2525}{3} = 841\frac{2}{3}$

total 245 g solution
 56 g cotton
 574 g alcohol

Make three lots with
 one lot of solution.

[ITEM(S) FOUND IN BOOK]

Gondwana Bed	10% x 7	70
Pana	1/10%	27
Cotton	8%	56
Chalk	82%	574
		700.79

Notebook Series -- Notebooks by Experimenters Other Than Edison Phonograph Record Experiments -- Disc Plating Books

These sixteen notebooks, which cover the years 1912-1916 and 1920, relate to the plating processes used in producing disc records. Most of the entries are by William W. Dinwiddie. Other employees who are identified as working on similar experiments include Charles Beaumont, A. Boetsch, Leroy E. Briggs, Peter C. Christensen, Peter Dempsey, William A. Hayes, John McMullen, F. Meschmeyer, Joseph Miller, Frederick P. Ott, Elroy Pearsall, and Albert F. Wurth.

The experiments in these books were aimed at improving the plating practices involved in making masters and submasters for disc records and at resolving specific problems in current practices. Edison's in this work is shown by references to plating experiments performed by him, as well as by references in several books, particularly N-13-04-04.2, to statements made by "Mr. E." The gap in plating work from 1916 to 1920 in this subgroup, as well as in the Notebooks by Edison series, is most likely due to Edison's decision to concentrate his efforts and his staff on work for the Naval Consulting Board and inventions for the U.S. Navy.

Although the notebooks in this subgroup are loosely related to each other, they deal with a variety of experiments. For example, there is a set of three books consisting of daily records of masters, their plating, and the results of the plating. Included are entries with some or all of the following information about the experiment: an identifying number for the record, the title of the recording, the recording artist, the type and condition of the record, room and bath temperatures, times and amps for the bath, and a report on results. Some books contain lists of various experimental plating solutions and their ingredients. Other books include plating "schedules" and formulas for various solutions used in the plating process. There are also books describing experiments with various ingredients, such as graphite, and different parts, such as anodes, that were used in the plating process.

Two notebooks have been selected because they include secret formulas and processes used in the plating of Edison disc records and because of their strong indication of Edison's involvement.

N-Number

Labels and Inscriptions on Front Cover

[additional information supplied by the editors appears in brackets]

Selected Books

13-09-27 "Copper Plating Phonograph Records"
14-05-28 "Silver Plating W.W. Dinwiddie May 1914"

Books Not Selected

12-07-26.2 "Copper Plating. Gold Plated. White Masters. July 26, 1913. Sept 4, 1913. W. W. Dinwiddie. No 1 to 200"; "Disc Records"

13-04-00.2 "Dinwiddie Plating Notes April, 1913"; "Disc Record"

13-04-04.2 "April 4, 1913. Dinwiddie Silver Plating Etc. Disc Records. S.O. 2913 -- "

13-04-22.1 "2 April 22, 1913. Dinwiddie -- Plating Disc Reports 500 -- 884 S.O. 2913. June. 4" [continuation of N-13-04-04.2]

13-06-24 "Dinwiddie Plating Experiments 6/24/13"

13-09-04 "Copper Plating. Gold Plated White Masters 201 to 400 Sept 4, 1913. October 11, 1913. W. W. Dinwiddie"; "Disc Records" [continuation of N-12-07-26.2]

13-10-11 "Copper Plating Gold Plated Masters October 11, 1913 401 to W. W. Dinwiddie"; "Disc Records" [continuation of N-13-09-04]

13-11-25 "W.W. Dinwiddie. Grafting Machine. Nov. 25, 1913"; "Disc Record"

14-01-19.1 "Copper Plating Wax Masters for Disc Phonograph L. E. Briggs. Jan 19, 14 -- "; "Disc Records"

14-04-03.2 "Grafite Experiments"; "Disc Records"

15-09-21 "Copper Plating General Baths"

16-11-28 "Plating Expts. November-1916 No. 503- W. W. Dinwiddie" [continuation of N-13-06-24]

20-05-01 "W. W. Dinwiddie"; "Disc Records"

20-05-23 "Nickel Plating Disc Records W. W. Dinwiddie"; "Disc Records"

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- Disc Plating Books
Notebook, N-13-09-27**

This notebook was used by William W. Dinwiddie during September 1913-August 1914. One additional notation was probably made in February 1915. The book begins with the inscription, "Let no one see this book without very definite orders from Mr. Edison." The entries consist primarily of a series of formulas, along with instructions describing current practices for plating the masters and submasters used in making Edison disc records. These were probably the culmination of numerous plating experiments documented in earlier books in this subgroup. Additional experimentation produced modifications in formulas and practices. For example, the use of submasters was discontinued shortly after 1913. Some of the formulas have been crossed out and changed, with an indication of the date on which the practice changed.

Among the practices described in this notebook is the method of preparing "dopes" (camolin and copper ink) for use in plating the wax masters, along with an indication of the object of using each dope. Also included is a description of the method of purifying the graphite used to make a conducting surface on the wax. In addition, there is a description of the formula and method of molding the wax masters, as well as an analysis of the defects in disc molds. There are indications that H. Grimes worked with Dinwiddie on some of these experiments. Several notes and letters to and from Dinwiddie dating from 1917-1920 are inserted into the book. The front cover is labeled "Copper Plating Phonograph Records." The book contains 28 numbered pages; some pages are blank.

W.W. Dinwiddie 9/27/13

Let No One see This book without very
definite orders from Mr. Edison
W.W.D.

36700
Amme Co.,
MFG. STATIONERS,
96 JOHN ST.
AND
19 PLATT ST.
NEW YORK.

Hope for regular baths for heavy plating.

Caminol.

500 g. Caramel dissolved hot in regular
plating solution $\frac{1}{2}$ strength. make
up to 2500 cc when cold by adding water.
Each 5 cc Caminol contains 1g. Caramel.

Caramel.

(Cane sugar heated slowly until 210°C
and kept at this temperature until
it loses 10% of its weight.)

For covering baths 1875 cc to 160 litres solution

For Wurth cylinder baths 500 cc to 22 gallons,
See page 2.

For Regular Baths 5000 cc to 300 gallons.
add more when work shows crystals.

For 80 Baths in Continual use 1250 cc.

Caminol added per week keeps them in Condition

| See schedule for covering Page 7-9 |
| with Copper Ink solution

Hope for Covering Baths.
Copper Ink.

20 g. #62 dissolved in 2500 cc regular solution.

2500 cc Copper Ink to 40 gallons solution.
see page 12

#62 = Azurino = Erioglaucine.

Made by Heller & Merz, 505 Hudson Street N.Y.
10768 bought 7/23/13 was ^{from their} batch No 73.

Solution requires to be used for a week or ten days to acquire the desired properties.

At first, except at very low current density, the surface is covered with brown mottles in a beautiful spiral form. Copper is too hard and is brittle, but has, even then, its "covering power" six times - that of ordinary copper, ~~no holes~~ when solution is in perfect condition is amp will not show more than a trace here and there of this brown mottling on the extreme edge or corner of the record ^{submarine record} ~~little dashes of brown like this~~ ^{of V. Martin}

The need of more dope is indicated by the records taking a longer time to cover. more dope may be added 100 cc per hour until trace of mottles appears on edge.

See Page 5 for Chemical Curing

After use in February 1955, but considerable difficulty in curing with H₂O₂. Note that the cure is not complete before using. Avoid oxidation.

See Page 4 for later practice

Chemical Curing Copper Ink Plated Solution.

To each bath of new solution (4 gallons) (15 1/2 litres exact) add 300 cc Copper ink (page 3) then add 80 cc ("Curing Hope") Hydrogen Peroxide (Baker & Adamson 3%) Before connecting circulation with other baths Test by plating a discarded submaster, and stripping after plating 1 1/4 hours after covering by regular schedule. Plating should be hard and cut up, should be free from pin holes. Too much curing hope will make appearance. Too little makes waste and Buckles on Master Moulds.

Solution For Master Room should be taken from submaster room, and all new solution added in submaster room. When copper becomes too soft add more copper ink - not faster than 100 cc per hour, and not more than 200 cc per day for 40 gallons solution. Look out for waste on Masters.

See schedule for covering - pages 7-9
 Will Dimmock J 24 4-14

Low ^{Don't Start} Schedule for covering
submasters in "Copper Ink" doped
solution. Wash in machine.

Start 1 amp. → have jets on, circulation on,
Con. 1/8 from edge 2 amp. bath 76 ± 2° F, surface of
Con. 1" from edge 3 amp. bath well skimmed with air
Con. 2" " " 4 amp. and over flow.
Music Covered 5 amp.

To Label 6 amp.
2" diameter remaining 7 amp.
1" diameter remaining 8 amp.

All covered 10 amp. → Put on celluloid cover.
After one minute 12 amp. → The main object
for this final boost is to insure that attendant
notices bath soon after cover is put on. It is then
likely to run undisturbed for 2 hours without trouble.

Plate 2 hours and transfer to general baths.
Wash thoroughly and transfer as quickly as
possible. Keep very wet

W.W. Dunniddie July 4-14

When submasters are transferred to general
baths they show a peculiar pink or old rose
color — this is due to burning at the tips of
millions of very minute hair like warts.

W.W.D. Aug 11-14

Schedule for Covering White Masters in Gopper Ink Doped Solution.

1. Put Rubber plug in center.
2. Blow off with compressed air. ~~blow off~~
3. See that bath is perfectly skinned, air and circulation on. Temperature $76^{\circ}\text{F} \pm 1^{\circ}\text{F}$. Keep Temp. between 75-77°
4. Put in bath - keep turning over away from you while going down in solution and until belt is on.



5. Adjust jets -
 { Be sure that A does not strike in thick layer of solution thrown by B etc. will make bubbles.
6. Start 1 amp.

$\frac{3}{8}$ covered $1\frac{1}{2}$ amp. boost before music is reached
 $\frac{1}{4}$ -1" covered 2 amp.
 $1\frac{1}{4}$ -1 $\frac{1}{2}$ " 2 $\frac{1}{2}$ "
 $1\frac{3}{4}$ -2 " 3 "
 $2\frac{1}{4}$ -2 $\frac{1}{2}$ " 3 $\frac{1}{2}$ "
 $2\frac{3}{4}$ -3 " 4 "
 $3\frac{1}{4}$ -3 $\frac{1}{2}$ " 4 $\frac{1}{2}$ "
 $3\frac{3}{4}$ -4" or music covered, unless very narrow, 5 amp.
 $2\frac{1}{2}$ diameter remaining 6 amp
 2" " 7 "
 A 77 covered 8 Amperes.
 Then boost every 4 or 5 minutes 1 amp until 15 amp and plate 5 hours before transferring to regular baths.

W.W. Jinniddle July 4-14

Object of using Gamirrol.

Prevents large crystals.

Makes fine grain smooth molds - easy to turn up.

Object of using Copper Ink

- 1 Prevents pin holes ABSOLUTELY 1/16 inch thick
- 2 Makes Very Hard copper - without loss of
Tensile strength - 84,000 lbs per Sq. inch (max.)
- 3 Graphited records cover in $\frac{1}{8}$ of the time required under same conditions in plain solution.

Hard rubber plating bath for 10" records
holds 15.5 litres filled to within 35 mm. of top,
with anode, filter, spider and record in place.

Master Room—

18 baths 279 litres + pipes etc = 300 litres

Submaster Room

24 baths 372 litres + pipes etc = 400 litres

Stone crocks 56 cm diameter 62 cm deep.
contains 2500 cc per cm of height—
or 5 litres per 2 cc of depth of solution.

One litre Solution Contains—

blue cup 200 g. CuSO_4 - Copper Sulfate
25 cc H_2SO_4 - Sulfuric Acid
specific gravity 1.815

U.C.D. Aug 14-19

To Test solution for Copper and Acid see pages 13-14

Solution to Test for Copper-

96 g KCN.
2234 cc Water.

Measure 4.5 cc Plating Solution

Add 10.0 cc Water

Add 8.0 cc Ammonia (94% made from 94% pure KCN & 6% pure)

20 cc of above KCN solution will clear

18 Copper is right—

Each cc more than 20 required means

50 cc water must be added to each

litre of solution.

Each cc under 20 required to clear means

each litre of solution requires 10 g CuSO₄.

When New KCN solution is made up test
it on standard plating solution paper

W.H.D. Aug 11-14

Solution To Test for Acid.

KOH 1-80.

3 parts	30% KOH
77 parts	Water

10 cc - plating solution to be tested
15 cc - Water

If plating solution contains right amount of acid 25 cc KOH solution will make it permanently milky.

For each cc under 25 required
add 1 cc H_2SO_4 per litre of solution

For each cc over 25 required
add 40 cc water per litre of solution

When New KOH Solution is made up
test it on standard plating solution - page 12.
W.D. King - 11-14

used previous to Jan 1914.

Wax.

(Page 16)

4643 { 4500 g. Caustic Soda
1800 { 1500 g. pure Aluminum Metal
224 { 235 lbs. Recrystallized Sal Soda

about 30 gallons water.

boil together until all aluminum is dissolved then filter.

2 { Melt 1000 lbs Stearic Acid - heat to 330° - Add slowly solution (1) then raise temperature to 420° and "foam off" all water. (P 25)

3 { Add ⁽¹⁰⁰⁾ 75 pounds ~~white trassone~~ ^(Standard Oil Company) FFF Value Oil ^(Mix well) and raise temperature to 450° and hold for about one hour. (P 29)

(P 21) Congelling point should be 270° F. If too high one percent of Stearic Acid for each 5° too high will make it right.

Filter, and centrifuge to remove very small amt of heavy matter. pour in pans to cool -

1045 lbs.

Analysis of Defects in Disc Moulds.

(P. 15)

Wax

Smoothness of cut varies with softener used

Hardness varies with softener - ^(P. 1)congealing point.

Grain - Fine - nearly amorphous with proper chilling

Egg Shell surface - blank not chilled. Traces with chilled blank used green and not plated immediately, also ^(P. 23)Attacked by solution - Congealing point too high
bad Stearic acid crystalline Vaseline

Streaks or patches of egg shell surface - solid chip of wax falling in mould.

Center or outside of blank with louder surface -

^(P. 24) Disc warped after removing from mould
from cooling too fast on one side.Chips - loose chips are all removed by
cleaning machine. Chips welded on
due to sticky wax, or to pressure or
being blown against the surface.

Blinds - Dirt or fibre in wax.

Holes - Air or dirt in wax.

Mechanical defects of recording.

Mechanical injuries - Finger marks.

Attached by air - Oxalic acid in scene ^(P. 25)

Analysis of defects in Zinc Moulds (Continued)

Cleaning -	Mechanical injuries.
Graphiting -	Moisture spots.
etc -	Dirt.
	Poor conducting graphite.

Preliminary
Plating

Oil dust floating on bath - bath not well skimmed and speck of dust adheres to the record - On account of its being oily it will not wet so it holds a minute bubble of air. Holds out like bubbles.
 Particles of loose graphite not blown off or washed off by jets.
 Moisture spots, oil spots, finger marks.
 Buckles - due to too strong dope in bath.
 Soft copper - due to too little dope in bath, indicated by slow plating.
 Mechanical injuries.

Analysis of defects in Ilise Moulds (Continued)

Outside baths - Keep temperature constant or solution will get under and attack surface of mould.

Polishing - Not cleaning thoroughly
Mechanical Injuries

Turning etc. Mechanical Injuries.
Buckles

Mounting in Steel Holders Buckles due to dirt behind
Mechanical Injuries

Celluloid prints - Celluloid defects. defects in dipping.
Scratches filled with Graphite.
Repeats - squeaks.
Not full print - defect in temperature or pressure, Schedule not followed.
Mechanical injuries - to mould or print.
Dirt on mould or Celluloid
Finger marks (P28)
G.L. Spindle Label

Analysis of defects in Disc Moulds (Continued)

Repairing: { Incomplete or imperfect repairs.
 { Mechanical injuries - repair tool etc.
 { Cut by reproducer.
 { Finger marks. (P 28)

Graphiting Celluloid Prints. { Too much graphite.
 { moisture or oil spots.
 { Finger marks. (P 28)
 { mechanical injuries

Plating: ^{substance} loose graphite not blown off.
 { Washing, not thorough - or algae not filtered from bath.
 { Dirt in solution - looks like algae. ^(clean all pipes & filter.)
 { Illust on surface of solution - Not properly skimmed when record is put in.

Working moulds. { Turning Mounting etc - Mechanical injuries -
 { Buckles - Dirt in Holder under mould.

Analysis of defects in Press Moulds (Continued)

Commercial Printing

Mechanical injuries. —

Dust-sand or dirt-particles or
varnish between mould and blank.

Fine scratches.

Congeling Point of Wax.

Take about 200 cc Melted wax in small dipper.
Stir continually with thermometer.

Hold in good light - not in a draught.

Read thermometer when a very delicate
scum forms at the surface - looks like
very delicate spider lines, or very delicate
film wrinkling on the surface.

Should be 270°F (Page 15) (Page 16)

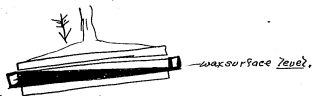
Read thermometer closely when near right. See
that there is no break in mercury of thermometer
if reading is high.

360°F is standard temperature for
pouring the wax in moulds.

Wax Casting Machine.

Mould - See Blue Print insert at back of this book.

Back of machine is raised about 1" higher than front to let air out.



Operations

- 1 Steam in top and bottom plate and ring - wax is poured. Must be hot (24 I) (also see page 21)
- 2 Top plate moved down against wax.
- 3 Water at 95° run thru jackets in place of steam
5 minutes (follow up contraction of wax with press)
- 4 Steam off ring.
5 minutes (follow up contraction of wax with press)
- 5 Lift top plate - when bottom plate will let go.
a little
- 6 Return press again to contact.
- 7 Run steam in ring until it's free.
- 8 Lift top plate. If it does not let go, finger nail will start it.

Wax Casting Machine.

- 9 Remove Ring
- 10 Lift off wax disc.
- 11 Cool between flat plates. Board slabs

Causes of Defects... wax casting

cracks and pull out,
too much pressure between
operations 4 and 5



Cracks. Water too cold
or left in mould too long.
Never have water above 95°F
as wax will be too soft.
also see (K)


- C If time between operations 3 & 4 is too long top of mould may let go first from wax.
- D If time between operations 3 & 4 is too short - blank may be concave on both sides or porous in center.
- E If time between operations 3 & 5 is too short blank will be too soft and surface may be cracked in handling


K - Valve in circulation pipe thru the lower steam plate is to reduce the flow thru this pipe and equalize the effect of the small flexible tubes to the top movable plate so that the two plates cool and heat up at the same rate. Handle should be removed when this valve is once adjusted.


L - Never obstruct the exhaust side of the steam jackets because they are not designed to stand pressure.


Wax Basting (Continued)

F. Water circulation obstructed or water too warm. makes same defect as E Also Wax not properly chilled and consequent Egg Shell surface (Page 16)

G.  bubbles at top surface.
Press moved down irregularly after contact with wax.

H.  void
wax on back edge of top plate - not cleaned properly. Prevents air from being forced out.

I.  lines on bottom of disc.
mould not hot at start.

J. 
wax cooled too fast on one side by water jacket, unless caused by cooling too fast on one side after removing from mould.

"Stearic Acid" is about $\frac{1}{2}$ Palmitic Acid, It is double pressed hot to remove the oleic acid which should not be in excess of 3% - more oleic acid will cause wax to be attacked by air, and probably make it more easily attacked by plating solutions according to Mr. Agleworth.

Vaseline or Petrolatum which is crystalline and breaks short causes the wax to be attacked by the solution much more than the sticky oily kind.

Wax is attacked by solution less when Standard Oil Company FFF Value oil is substituted for vaseline than any other of about 80 softening media tried.

When wax is attacked by solution the mould looks red when stripped from wax. When it is not attacked the copper is left covered with graphite and when cleaned leaves beautiful polished surface.

Wax Filter.

Graphite.

Dixon 097 Graphite 1 part, Caustic Soda 2 parts or more.

Heated red hot for two hours.

(Poured red hot into water)

Wash out Silicate of Soda. Can be washed out more thoroly by adding Soda to 2nd & 3rd water as silicate is unstable except in presence of Alkali.

After ^(washed) thorough washing boil in Hydrochloric Acid to remove iron. 2 1/2 hours -

After ^(washed) thorough washing and drying boil one hour in strong Nitric & Sulfuric Acid equal parts. to split flakes and increase conductivity. Repeat 1/2 parts acid to one part graphite required.

Dixon 0485 Graphite is about as good as 097.

T. P. Kelley Foundry Supply Co. 544 W 22nd St. N.Y.
No 55 Smoke graphite 8 1/2 lbs has best conductivity is very fine but does not stick to cathodes as well as the Dixon 097 as heated by us. When treated by above process it cokes.

Finger Marks.

on wax master - ^{not} before graphite - may show on strip wax.
 After graphite - does not show on strip wax
 unless rubbed.

on submaster Made before final graphite - show black on
 celluloid print. copper mould when strip.

Made after final graphite - show copper
 colored on copper mould. Very conspicuous
 if made with oily fingers. but always
 leave less graphite on mould than parts
 not touched

[ITEM(S) FOUND IN BOOK]

Mr. Linnardie -

Following is a list of
dates on which Cammell Stope has been
added to the Cu. plating solution.
The last date you have is Dec 24-13,
1250 C.C. in Source Plating Room on Crocks 3-4.
Upper Plating Room will be known as Crocks 1-2
The Iron Tables will be known as 5-6 and 7-8
Crocks 1-2 Crocks 3-4 Crocks 7-8

	1250 C.C. Dec 24-13	
1250 C.C. Jan 2-14	1250 " Jan 2-14	
	1250 " " 8-14	
1250 " " 12-14	1250 " " 13-14	
1250 " " 19-14	900 " " 19-14	
	650 " " 23-14	5000 C.C. Jan 30-14
1250 " " 24-14		
	700 " " 26-14	
	800 " " 29-14	
1250 " " 30-14		
	800 " " Feb 2-14	
	800 " " 5-14	2500 C.C. Feb 5-14
1250 " " Feb 5-14		
	800 C.C. " 9-14	
1250 " " 12-14	800 " " 12-14	700 " " 12-14
650 " " 14-14		
	800 C.C. " 16-14	
650 " " 18-14		700 " " 18-14
2-19-14		Ermine

[ITEM(S) FOUND IN BOOK]

Mr. John V. Miller
Edison Chemical Works,
Silver Lake,

April 17th, 1917.

Re - Raw Material for Disc Masters:-

1st. Stearic Acid:-

Copy of letter to Purchasing Dept. June 20-1916 attached shows what we have done.

The practical test referred to was to make a small sample of Wax as follows:-

4.64 grammes Canstio Soda
1.80 " Aluminum
101.60 " Sal Soda
115.00 Water

Boil until all aluminum is dissolved and dilute to 300 CC.

This is enough for 9 test batches of wax as follows:-

50.5 g. Stearic acid from each sample.
33 1/3 cc of above solution.

put solution into the melted stearic acid slowly temp. 330 F. raise temp to 420 F. until foaming stops; add 3.788 grammes of FFF valve oil; raise temperature to 450 F for two or three minutes stirring thoroughly with thermometer. Pour into a 2 1/2" diameter disc.

In testing a new sample a check test should be made using some stearic acid which we are using now, or know about, so that we may not be thrown off by some variation in the other ingredients.

The discs are then cut flat on one edge and part of one face shaved to expose a cut surface. They are then placed in plating solution half emerged for 24 hours to see if the wax is attached by the solution. I have usually drilled a hole in center of each and strung them on a wire to prevent their falling over in the solution.

Oleic Acid causes the wax to be attacked by air; Mr. Aylesworth considered 3% the danger line.

We have never had anything like 3% Oleic in the tripple pressed stearic acid, and have never had any trouble from it.

(2nd. FFF Valve Oil made by Standard Oil Company; this is tested by coating small discs same as we test the stearic acid, but we start with hard wax and take 50 g. of hard wax (wax made without oil, but complete otherwise) and add 3 1/2 grammes of each sample of oil. The best is the one least attacked by the solution - but it has to stand a more important test and furnish a proper softener to give the wax the right cutting qualities. This can only be determined by making up Disc Masters and recording on them. A considerable difference might not be apparent until a change of season from Summer to Winter might make it impossible to use the wax.

(3rd. The Canstio Soda is the same as used by the Edison Primary Battery.

(4th. The Sal Soda must be recrystallized.

This is not a matter of purity, but the anhydrous will not combine with the aluminum.

If the weight is not all crystals, the proportions are not correct.

(5th. The aluminum we have been using is rolled sheet metal which we have not

tested in any way but buy it for commercially pure aluminum.

If there is anything not quite clear in the preceding, or if I can be of any further service in regard to this matter, please call on me.

W.W. DINWIDDIE.

Noted & Copied 5-5-17
W.W. Dinwiddie

[ITEM(S) FOUND IN BOOK]

February 26th. 1916.

Mr. J. V. Miller

For

Mr. W.W. Hoffliams
Phenol Resin & Wax Dept. Chemical Works Division,
Edison Storage Battery Co., Silver Lake.

The following data in regard to mechanical work on wax blanks was furnished
me for you by Mr. Gopfert who was at one time foreman of the Shaving Department.

SPEED OF MACHINES FOR FINISHING WAX BLANKS

STANDARD BLANKS

Reamer	140 per min.
Edging	3080 " "
Rough cut Arbor	2650 " "
" " Feed	325 " "
Shaving	1600 " "

COMMERCIAL BLANKS

Reamer	140 Per Min
Edging	3080 " "
Rough Cut Arbor	2364 " "
" " Feed	350 " "
Shaving	1600 " "

LENGTH OF BLANKS

Standard	4 1/2 in.
Commercial	6-7/8 in.
Master	4-11/16 in.

DISC BLANKS

3/4 x 10-1/2

HANDED BLANKS

Boring	1200 per Min.
" Feed	400 " "
Rough Cut Arbor	2650 " "
" " Feed	575 " "
Edging	1675 " "
Bevel	2035 " "
Shaving	1117 " "

DISC BLANKS

Roughing	544 " "
Finishing	330 " "

DIAMETER OF BLANKS

Standard	2.167 in.
Commercial	2.335 to 2.212
Master	2.225 x 2.235

HIGH AND LOW

Commercial	2-3/8 to 2-1/16
Standard	2-13/64 " 2-1/16

W.W. DIMMIDIE.

Copy to Mr. R. Lee.

Specs of machines for finishing wire blenders

Standard	
Reamer	410 feet
Edging	3480 " "
Rough feed	325 " "
" " feed	2850 " "
Shaving	1800 " "

Comm. Blender	
Reamer	410 " "
Edging	3070 " "
Rough feed	2364 " "
" " feed	320 " "
Shaving	1800 " "

Master Blender	
Rough feed	1200 " "
" " feed	400 " "
Rough feed	2850 " "
" " feed	575 " "
Edging	1875 " "
Shaving	2035 " "
Shaving	1117 " "

Disc Blender	
Roughing	344 " "
Shaving	330 " "

Length of Blender	
Standard	4 1/4 in
Common	6 7/8 "
Master	4 1/16 "

Draw of Blender	
Standard	2,187 in
Common	2,335 " to 2,212 in
Master	2,225 X 2,235

Disc Master Blender
3/4 X 10 1/2

High & Low	
Common	
2.375 to 2.0625	
Standard	
2.202 to 2.0625	

Spice of machines for finishing wax blanks

Standard blanks	
Reamer	140 per min
Edging	3080 " "
Rough cut lathe	2850 " "
" " feed	325 " "
Shaving	1800 " "
Comm blanks	
Reamer	140 " "
Edging	3080 " "
Rough cut lathe	2364 " "
" " feed	320 " "
Shaving	1700 " "

Master blanks	
Reaming	1200 per min
" feed	400 " "
Rough cut lathe	2850 " "
" " feed	575 " "
Edging	1875 " "
Bevel	2035 " "
Shaving	1117 " "
Disc blanks	
Roughing	344 " "
Finishing	330 " "

Length of blanks

Standard	4 ¹ / ₄ in
Comm	6 ¹ / ₈ " "
Master	4 ¹ / ₁₆ " "

Diam of blanks

Standard	2.187 in
Comm	2.335 to 2.212
Master	2.225 X 2.235

Disc blanks
3/4 X 1 1/2

High & Low

Comm 2 3/8 to 2 1/6

Standard of 2 13/64 to 2 1/6

[Signature]

Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- Disc Plating Books
Notebook, N-14-05-28

This notebook was used by William W. Dinwiddie in May and June 1914. At the beginning of the book are formulas for a silver solution, a reducing solution, and a washing solution; these formulas also appear in other books in this subgroup. Most of the entries describe experiments with "commercial" records or submasters washed with gold dust. The results and appearance are noted. There are occasional references to experiments by Moore, probably Sherwood T. (Sam) Moore. Also included is a list by Edison of suggested chemicals, with a notation that he will make additional suggestions if these do not work. The front cover is labeled "Silver Plating W. W. Dinwiddie May 1914." The book contains 28 numbered pages; some pages are blank.

For silversmithing

1

Formic Aldehyde Process

A Silver Solution { 4000 cc Dist Water,
80 g. Silver Nitrate,
(33 cc) strong ammonia 26%
Ammonia added slowly to clear ~~with~~ ^{these} then,
Nitrate Silver solution (same strength) added
a few drops at a time until solution is
straw color.
Filter thru paper

B. Reducing Solution { 4000 cc Dist Water ^{Wol} see Page 23
150 cc Formic Aldehyde
(Filter thru paper)

C. Washing solution { 3000 cc Dist water.
50 g stannous chloride
clear with ~~with~~ few drops HCl.

Wash or wet ~~thoroughly~~ with C, rinse in distilled
~~water~~ ^{water} - do not let dry - then
pour together equal parts of A & B
and pour immediately on surface to be
removed from solution before solution
becomes muddy.

Commercial Record
 Washed with Gold Dust
 The Chloride } looks good one big star
 & 20
 also

Commercial Record
 washed with Gold Dust
 150 cc Silica
 150 cc Reducor + 5 cc Alcohol -
 looks good - slight yellow
 several small stars

Same only 25 cc Alcohol
 looks better.

Commercial Record
 washed with gold dust
 trilled and etc -
 150 cc Silica
 150 cc Reducor + 10 cc Glycerine
 Several stars - Surfaces
 covered with milky smears,
 but a good coat

Commercial Record
 washed as above
 150 cc Silica
 150 cc Reducor + 10 cc Sugar
 Several stars but a
 very beautiful white coat -

4

Commercial Record
 washed same as preceding
 20 cc alcohol
 and 20 g. granulated sugar
 added to reduce
very best yet

5

Commercial Record
 washed in Gold Dust
 immersed in tap water
 same as preceding
 { 20 cc Alcohol
 { 20 g granulated sugar
 { 5 drops nitric acid
 added to reduce -

Nitric acid makes reduction
 much slower, but silver
 is not so bright -

Same 10 drops Nitric acid
 instead of 5 drops -
 about same -

Commercial Record
 same treatment except
 10 drops of Acetic Acid
 substituted for Nitric
 very yellowish silvery
looking coat of silver

8.

Moore's Experiment 49

silvered with Jones Hdsyde solution.
 treated reg way with ticebroid
 rinsed with 400 cc water + 3 cc ammonia
 see plating Exp. Book page 16 -

9

May 28-14

Moore's Experiment X50

Enduroite submaster -
 washed in Cold Dist -
 rinsed thoroly - tap water -
 covered the object solution -
 washed in Dist water -
 washed in Dist water - 400 cc ammonia 3 cc
 silvered face down 150 cc each solution -
 just back in ammonia solution - then to bath -
 showed only one star - edge did not
 plate good - not enough silver solution -
 place on mirror near inside pulled
 after plating 3 min - 1-3 amp.
 plates very uniformly.

10

May 28

Microscopy: No 54

Condensate Substrate

washed in "Gold Dust"

rinsed thoroughly tap water

washed in the Chloric solution

washed in dist water

washed in 400cc dist water + 3cc 20% ammonia

washed again in dist water

silver face down in 200cc each solution

rinsed through in dist water & put in Cu bath

Showed about 20 stars - in silver

Cu. showed pin holes in each star

plates very irregularly

plates about 20 min - pulled in ribbons

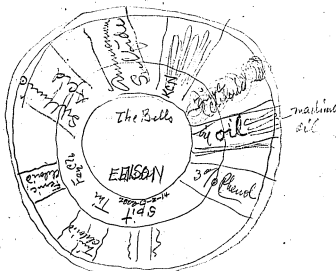
on one side - removed from bath

Silvered ^{the} 29 time.

See plating exp't book,

11

May 28 - 1914



Silvered same as Thomas exp't No 50

no trace of anything but fine silver,
and this dried on and silver plates -
ammonia sulfide shows a little

mg plating solution + 95% Alcohol ✓
 + granulated sugar ✓
 + glucose - ✓
 + nitric acid ✓
 + Copper ions ✓
 + Acetone ✓
 + H_2O_2 ✓

✓ Glycerine
 ✓ Ethyl alcohol
 ✓ Methyl Alcohol.
 Pyridine
 ✓ Phenol 1 in 2% sol.
 ✓ Glacial Acetic Acid.
 ✓ Glucose
~~Alcohol~~
 ✓ Aniline Oil - 3% sol in water

Water Soluble Dyes -
~~Alcohol~~

If none works will give
 list of many substances
 very sol in alcohol
 which will reduce
 speed of reaction probably

Moore's Experiment 58
 Washed in "Gold Dust" solution
 rinsed
 washed in tin chloride,
 washed in dist water,
 washed in ammonia solution 9 cc to 400 cc
 200 cc reducing solution + 10 drops HNO_3
 200 cc Silver solution
 put back in ammonia solution
 rinsed in dist water - showed
 many small stars, but came
 very uniformly in Copper bath -

May 29-14

150 cc reducing solution + 10 cc 95% alcohol
150 cc silver solution

1 { tested same as preceding page. more of silver
fine coat silver, face down -
only one pin hole - v. clear solution

2 { same as above but + 25 cc Alcohol -
fine coat silver no holes - several spots

3 { same as (1) but + 10 cc Glycerine
several stains, surface looks waxy

4 { same as (1) but + 10 g. granulated sugar
fine bright coat silver

5 { same as (1) but + 20 g sugar and 20 cc 95% Alcohol
v. fine bright coat silver -

Small pieces, Celluloid -

25 cc Silver + 25 cc Reducor + 1 drop HNO_3
v. v. clear solution silver reaction -
silver sticks v. tight.

same + 10 drops HNO_3 - no reduction of silver.

same + 6 drops HNO_3 - v. slow, v. clear
thin deposit -

same as above + 1 g glucose - solution
turns dark brown very quick - then
black - plates muddy looking silver

same as above + 2 cc of 3% Phenol
reduces v. quick solution turns dark
not regular -

same as above + 5 cc peroxide hydrogen
Silver all oxidized no reduction

same as above + 2 cc acetone - no effect

same as above + 5 cc 1% solution (6-4)
no effect,

but above is HCl, slight reduction
on acc. of the chloride.

May 30

{ 2500 Silver
2500 Reducer + 1 cc Copper Sulfate } no effect

{ 2500 Silver
2500 Reducer + 200% Ammonium Bromide } all silver dissolves
down by solution
no silver remains

{ 2500 Silver
2500 Reducer + Sulfuric Acid } turns light brown
within 40 min. 20
— try again —

{ 2500 Silver
2500 Reducer + 2 cc Acetic Acid } v. slight reduction

{ 2500 Silver
2500 Reducer + 3 drops Acetic Acid } v. slow reduction
turns dark

{ 2500 Silver
2500 Reducer + 1 drop Acetic Acid } action about same
as H₂O₂

June 1

Morris' Exp't No 60.

Washed in Gold Brist Solution -

Placed in tap water

Washed in thin Chlorid ~~solution~~

Washed in (2) Dist. water

{ 200 cc reducing solution + 20 cc 75% Nickel + 20 g. granulated
sugar + 10 drops Tartaric Acid.
2000 cc Silver solution

fine coat - ununiform - but several stars
and very poor edge - would not wet.

Not in path and would not plate on
account of poor contact at edge -
just along enough to allow silver
cleaned with nitric acid, and grafted.

Monroe Sept 61
 plates same as no 60 except
 that edge very well rubbed
 with tin diborid - edge plates better
 than 60 but poor. (9 stars)

June 20th

{ 25cc Silver -

{ 25cc Reducer + 20 drops Aniline Red Oil Solution
 makes white precipitate in Reducer -

{ 25cc Silver -

{ 25cc Reducer + 60 drops Aniline Red Oil Solution
 makes white precipitate in Reducer -
 (quite restrained) - silver even -

{ 25cc Silver

{ 25cc Reducer + 5cc Blue Aniline Oil Solution
 acts same as Red aniline oil but
 more soluble -

{ 25cc Silver

{ 25cc Reducer + 4cc Blue Aniline Oil Solution
 + 8cc Alcohol - not so much white
 precipitate which is soluble in alcohol
 but solution darkens sooner -

25cc Silver

25cc Reducer + 5cc Absolute Alcohol
 Alcohol NO effect

plates irregular,

June 1 - 1914

ashed in "Gold Bird"
 rinsed in Tap Water -
 washed in Alcohol
 washed in the chloroform
 washed in two dist. waters
 200 CC Silica
 200 CC. Redmen + 20 CC 95% Alcohol
 + 20 g. Sugar -
 V. fine coat. Silica
 but has several stars,

Best yet

June 2 - 1914

Same treatment as next
 preceding except washed in
 Benzol instead of Alcohol and
 dist water instead of tap water,
 several stops

Same as above except,
 washed in Turpentine oil instead
 of Benzol,
 several stars.

June 4 -

Used Pyrogalol instead
of Tin chloride suggested
by Sphenoth -
would not meet edges well & G,
showed stars v. bad.

June 4.

Made up Reducing solution (100%)

{ 2000 cc Water
75 cc Formic Aldehyde
200 cc 95% Ethyl Alcohol
200 g. granulated Sugar
1 cc Nitric Acid

{ Used Pyrogalol with this reducing
solution - worse than with
regular reducer. See page 1

{ Plated v. fine with the tin chloride
wash - use 20% more of
this than of silver solution.

{ Washed with 95% Alcohol after
tin chloride - looks fine

{ Washed with 1% Nitric acid
then 95% Alcohol after tin chloride,
looks fine

{ Washed with 500 cc water + 25 cc 37% HCl
after tin chloride - then 95% Alcohol
Smeary - try again - may
not be due to HCl.
All above have stars -

June 5

Moore's Exp. 63 (leave all alone)

Washed in Cold Dist.

" " Dist. Water.

" " Tin Chloride.

" " 2 dist. water -

{ 200 cc Silver Solution -

{ 240 cc reducing solution (p. 23)

Good coat of Silver. several v. small stars -
 corner not perfectly coated in copper -

June 5

Moore's Exp. 65 -

Washed in Cold Dist.

" " Dist. Water -

" " Tin Chloride.

" " Dist. Water -

" " 75% Alcohol -

" " Dist. Water -

200 cc Silver Solution

240 cc reducing solution (p. 23)


corner did not plate - where it
 is rounded off and did not receive pressure.

Washed in 75% alcohol -

Wiped dry with new towel -

edge grapted - blown off

Schematic clip



This area seemed to be anode
 and silver eaten off.

after plating for some time
 pulled at this place - new coat -
 copper plated on clip and edge - and
 on opposite side - this part seemed
 to be anode in feeding opposite side.

Started with too much current.

June 5

{ 200 cc Silver
 { 22 cc Reducer + 1/2 cc few drops
 Potassium Dichromate Solution,
 diffused precipitate
 no Silver Reduced.

{ Same as above but with
 Potassium Chromate
 Same reaction

{ 200 cc Silver
 { 22 cc Reducer + small amt Hydrogen
 Sulfate -
 Retards reduction
 very much - tried twice

{ 200 cc Silver
 { 22 cc Reducer + 1 cc 5% solution
 Ammonium Sulfate

{ 200 cc Silver
 { 22 cc Reducer + 1/2 cc 5% solution
 Ammonium Sulfate

→ Best Retarder

June 5

200 cc Silver
 240 cc Reducer + 5 cc 5% Solution
 of Ammonium Sulfate

Very slow reduction
 Silver bright thin -
 Solution poured off
 perfectly clear -
many stars

28

Reducer No 3

2000 cc water

75 cc Formic Aldehyde

200 cc 95% - Ethyl Alcohol

400 g. granulated Sugar -

25 cc 5% solution of mucous Sph.

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- Record Varnish Books**

These five notebooks were used primarily in 1913 and 1914 by William W. Dinwiddle and Sherwood T. (Sam) Moore for notes on the varnish used for Edison disc records. One book has a few entries from 1916. Other experimenters who are identified as doing related work include Charles T. Dally, H. Grimes, and Archie D. Hoffman. Included are tests of various experimental varnishes and different methods of varnishing, along with tests of how certain conditions affected the varnished record. Also included are experiments aimed at resolving specific problems, such as preventing wave formation on the records during varnishing. Some of the work in these books is related to experiments by Edison, Dinwiddle, Hoffman, and Moore in a four-book set beginning with N-14-04-30 (see Notebooks by Edison).

Two books have been selected for indications of Edison's involvement.

N-Number Labels and Inscriptions on Front Cover

Selected Books

14-02-23.2 "M"
14-05-14 "Davis"

Books Not Selected

13-09-28 "Disc Records"; "Varnish Dinwiddle"
14-08-17 "Dinwiddle Cresol -- distilling, etc."; "Disc Records"
14-08-19 ---

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- Record Varnish Books
Notebook, N-14-02-23.2**

This notebook was used during February-June 1914 by Sherwood T. (Sam) Moore and probably J. W. Poole for notes on experiments with varnishes, presses, and manufacturing processes for disc records. Also included are entries relating to experiments with powder blanks and with loading the blanks into the machines. Defects in the varnished disc records or prints are indicated. Charles T. Dally and Archie D. Hoffman are mentioned as doing related work, and some of the entries may be by Dally. There are also instructions from Edison to Moore pertaining to proposed experiments with disc record blanks. Some of the entries include a notation that the experiment was done for Edison. Pasted into the book is communication from Edison's personal assistant William H. Meadowcroft containing a description of Moore's work. Among the loose items inserted into the book is a one-page note in Edison's handwriting describing procedures for loading blanks into the machines, pressing them, and shaving them. The work in this book is related to experiments by Edison and Moore in N-13-12-08.2, Notebooks by Edison. The flyleaf is signed J. W. Poole. The front cover is labeled "M." The pages are unnumbered. Approximately 125 pages are used.

Geo. P. M.

59890
Acme Co.,

MFG. STATIONERS,
96 JOHN ST.

AND

19 PLATT ST.
NEW YORK.

1000

2.00 per hr

Smiths co

Feb 26-14 #632 Var Lot # 97A

Try one machine to day flowing
plates the regular way, but let
plates sit on rack 2 hrs. wanted
to see if plates would look better
and more even than regular way.
Temp room 88°F weather clear, sunshine

Feb 26-14 #632 Var Lot # 97A

Trayed one Lot 840 Plate 632 Var. standing like
in cages then put in oven and run regular
way. Temp. of oven 90°F when starting

Feb 27-14 Var #632 Lot 97A

Received 340 plates

Defects uneven - 61

Bubbles - 47

Redded - 9

Chipped R - $\frac{5}{120}$ Discards

290 uneven Plates Redded 23 Small Bubbles
407 OK Plates

720 Plates Transferred

Feb 27-14

Having some poor success in transferring
fix over, as plates are so uneven try taking
plates after rit and submerging in pans of
alcohol letting alcohol run over faces
of varnish two or three times, then put
on racks to dry.

Feb 28-1914

Boole

Received 15-4 Plates Flowed 2/27/14

24 Good Plates uneven - 8

33 uneven Packed Bubbles - 7

32 Bubbles " 15 Disks

139 Plates sent to Press

Feb 2-1914 Received +20 Plates

Var #632 Lot 99 even #1

Special Bubbles - 10

2. Hor on rack Raised - 10

34 Bubbles Packed uneven - 25

118 uneven "

225 Good Plates 377 Plates Transferred

Flowed 2/27/14

3.27

Feb 28-1914 Received 420 Plates

Var #632 Lot #99

2 Hrs Standing on Racks

Flowed 2/27/14

216 OK Cracked - 1

24 Bubbles used Dist - 3

129 uneven " Bubbles - 11

369 Plates Transferred uneven - 36

51 Discards

Transfer inspection Plates Transferred

Lot No. Var Transferred Acc Com No. %

97A 682 385 248 18.119.67

Transfer inspection 2 noon 9

Lot No. Var. Received OK

97A 632 248 248

Printing Dept - Feb 28-1914

Lot #97A. Var 632 236 used reg

Schedule - Printing had many for Print

(12 Bubbles went through with 84 plates)

Testing Dept Feb 28-1914

Lot #97A. Var 632 Mkt 719 = Packed 236 236 used reg

Bubbles 20 2 5 13 65 147 632

OK

The Registry
632-772 240 records
23 Pps front
20 cracks

This report was taken from
the board. No other reports which
would be twice the dis.

Exp 2 hrs on rack. 236 record
3 cracks
65 pps front

3/4/14
Varnish 632-104 50% Pps front

3/4/14

Varnish 632-106 and 107
this sun fire flowed easy.

After baked surface look good.
Little eggshell.
see transfer.

3/5/14

Reg Varnish 632-112

Vis 5.52

Flowed fully for 7 to 1030 then
thrusting up at 3 P.M. very slight
and getting worse

3/6/14

Special Varnish 764-114.
Flowed fair Vis?
see Framing

see Printing

March 7-1914 Special Var # 764 over #2
Lot # 114 B Night work
Received 700 Plates

Defects Raised - 3

Cracked - 3

Chipped R - 11

Patched Plates - 3

Bubbles - 29

uneven - 49

Total 98 Discards

Small Bubbles Patched 105 - Plates

uneven 147 - "

O R 350 - "

Test on wire 12/14

Test of heat on pipes
3/26/14
Night 11.25 PM Day 8.25 AM

#9-a
test on plate
5 in 270°F
10 in 300°F
Chart
110 Lbs
High Pressure
Steam gauge
160 Lbs
11.25 PM.

test on plate
5 in 350°F
10 in 290°F

Chart 108 Lbs

High Pressure
Steam gauge
155 Lbs
8.25 AM

10 pound pressure running
when test made

10 pound pressure
running
when test made

4/3/4
Salley Powder #2
Sum 110

6 Would load with
scraper set. time 38-1 min

6 Would load with
scraper set $\frac{1}{2}$ hour.
time to scraper 1,20 to 2,35

3/10/14

Reclaimed Blanks

ground transfer blank (with Varnish, etc)

#1 { 315 gms #719 powder reg.
35 " ground blank.

#2 { 223 gms #719 powder
87 gms ground blank.

#3 { 228 gms #719 powder
122 " ground blank

#4 { 175 gms #719 powder
175 " ground blank

#5 { 140 gms #719 powder
210 " ground blank

#6 { 88 gms #719 powder
262 " ground blank

#7 { 350 gms ground blank.
this blank cracked
in making

march 14-14

Reclaimed Blanks

Transfers -

#1 - second due to Red Spot.

#2 - second due to Red Spot -

#3 - O.K. - Print OK

#4 - O.K. - OK

#5 - O.K. - Poor print

#6 - O.K. - OK

#7 second Blank cracked through

Used 632 TAN - #119 set -

Ground by
Smith Co. Wheel and Cyl. Works
Canton, Pa.

957. 180 mesh

Moore, try all reground powder also
 $\frac{1}{2}$ 4 $\frac{1}{4}$ 4 25% ground + 75% regular

Mr. Edison -

Moore says that the
additional presses are being put
up, and they hope to complete
them this week.

He also says that samples
of ground up powder blanks have
been received, and in one case
75% would go through 180 mesh
and in another case 95%.

He says they have enough
of the powder to make up some
sample blanks, upon which he
will report later.

Wm. H. Leabowoff

Mich 10/14

1
315 gms. # 719 ✓
35 " Spec.

2
263 gms. # 719 ✓
87 " Spec. X

3
228 gms. # 719 ✓
122 " Spec. Hoffman

4
125 gms. # 719 ✓
125 " Spec. X

5
140 gms. # 719 ✓
210 " Spec.

6
88 gms. # 719 ✓
262 " Spec.

7
380 gms. Spec.

Moore -

Here is these Expts we should try on blanks - You know I guessed at 6/4 % in blank & may be we have too much or too little -

Pella Run thru 840 which is $\frac{1}{2}$ overfull of -

The Pella varnish in blank #761 to have $\frac{1}{4}$ more of 6/4 in than Reg

The 840 blanks having one fourth less 6/4 than Reg - #762

+ 840 having $\frac{1}{3}$ less - #763

Note % in Transfers Cracks in long printing & fill - a surface -

2

2/23/14

#761 Transfer 632-88-A Varnish made 497 - 1155 reg. schedule

OK	2nd	Div	
225	59	213	45%

Print 225 also registered in

OK	Print	Cracked	
133	61	31	

3rd Transfer			
21	18	50	

#762 Transfer 632-88 Varnish made 504 - 1155 reg. schedule

OK	2nd	Div	
279	71	154	55%

Printing 297

OK	Print	Cracked	
149	69	61	

3rd Transfer			
24	27	20	

1913

9/28/14

#763 Glumes 632-90 Varnish
Transfer use reg schedule
cracked 504 Transfer

OK	Ind	Dec	} 89%
200	110	194	

Printed 200 use reg schedule

OK	Boil/ind	Cracked
101	45	32

Ind Transfer		
53	34	23

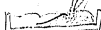
3/6/14

#764 Varnish-114
10 gal, about 700 Transfer plants
4% to 5% Penta

Transfer
Thinner 301 use reg schedule
OK 224 Dec 77 74.5%

Printed 22-1
OK 193 Boil/ind 13 cracked 18

3/2/14
 Bank passing
 told H. and his man to map
 to form powder in middle, seraph
 did nothing -



many



might

on 3/2/14 his man found
 very mysterious matter under each
 Hunk in the middle of the map

on 3/2/14 I transferred same
 12 in all was reg. scheduled 100
 15-500 lbs, got 100 %

Print 10 OK 1 embled 1 post print

We are now trying to do are
 holds the mid. down to the

6-2-140-8 Vmms

Vacuum Bryans
Jack Hoffman

9/30/12

3/26/14

Special blank: #719

Penite.
J. P. Puring This blank found
took gen. to me.

3/18/14

Varnish
on 3/18/14 Hoffman, Dallyard
and myself, agreed on
Voc of varnish, \$3.30 to \$3.40.

<u>Hoffman</u>				<u>Tab.</u>	
3/13/14	Ted	1392	V	3.22	3.50
"	"	124.0		2.32	2.32
"	"	125.8		2.16	2.02
3/14/14	"	125.8		"	
"	"	126.0		2.52	3
"	"	127.8		2.44	0
3/16/14	"	127.8		"	0
"	"	128.0		3.26	7.03
"	"	127.8		5.47	4.04
3/17/14	"	127.8		"	
"	"	130.2		2.35	4.45
"	"	131.8		2.52	4.03
3/18/14	"	"		"	
"	"	133.0		2.20	3.24
3/19/14	"	134.8		3.79	3.11
"	"	135.0		3.18	
"	"	136.8		3.47	4.07
3/20/14	"	137.2		3.27	4.59
"	"	138.8		2.55	2.34
3/21/14	"	139.0		2.43	2.12

Haftmann

Lab

9/1/14	Lat	140-R	Vi	2.88	Vm	0
9/2/14	"	141-Q		3.99		505
"	"	142-B		3.67		321
9/24/14	S	143-B		3.58		000
"	Lat	144-Q		3.25		402
"	"	145-B		3.37		406
3/25/14	"	146-	30500	3.27	V-	745

at 7000m Sept 70' 10.00 AM

Note: 3/27/14 Vm at 70' 10.00 AM
 Sept 70' 10.00 AM Vm at 70' 10.00 AM
 70' 10.00 AM Vm at 70' 10.00 AM
 Vm 1220

3/24/44
Special Vamsh
777-157 No 3.53 3 1/2 PM

3/27/40
Cell Exp for schampke
9 cell disc put in one 4+ lion
3 1/2 hrs. Started at 100°F ran up
to 200°F

12 3/16

down to 3 in dia.

Will dip this and see if they will
be loose.

Exp #122

Exp for S Ott 4/2/14

Blankpot 719

Varnish in one with
reg transfer heat 7 hr schedule

4 Varnish with 1 coat

4 Dis { 1 Small bird
3 Thin Herring

Transfer reg schedule 15-500, V632-168

2 coat Exp

OK 2 Look good

Dist. Unit Morgan

• 1 crack



1/4/14

Special Banks

No of stamps running 365 to 464

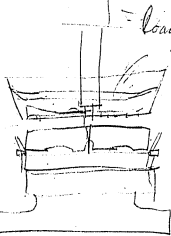
4/2/14 test on powder

9 AM 51 to 70 pm

3 PM 54 to 70

4/4/14 5 PM 60 to 66 pm

March 20/14



= loads from bridge
in man
I think it will
be more uniform

March 20/14

Exp on loading blanks

#1 loaded 11 with 11 grains
don't scrape any right
[] stop hammer by hand
drop 11.50. 11.50. 11.50. 11.50.
out. [] handled in much
inadequate [] punched
mould in press. not blank
any press. held schedule

blanks not baked & transfer
11 blank look good. no dimes

(0)

#15 Exp. is 12 blank that
was made by error operation
Press in regular or as he does
but def. 1

Transfer 1/2

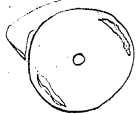
1 blank has

7 61

(0) times.

one coil

This Epp is to try to
over come the trigger for hollow



Press #9 scraper set reg way #1
24 blank made and transfer #55 set.
7 dis for thin margin
1 dis for cork center.
16 OK Print

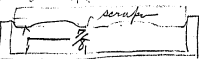
Press #14 scraper set #3
24 blank made and transfer #55 set.
11 dis for thin margin
6 dis for blister
1 dis for inner varnish
6 OK

Scraper Epp

-3/21/14

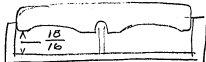
Epp powder blank

Reg way #1



#1-9 Epp

#2



8 ~
5 ~

Varnish 632-1372.

Transfer inc. Reg. set #55
15 min. at 500 lbs

cool

12 min at

6 OK

4 dis { 2 dots center
2 dots edge.

Print

8 OK

Transfer
4 Com. (C)

3/20/14

Treasure from 24 blanks
was reg. schedul

Varnish 632-138.8

15 in 500 lbs.
No Hargum-hollo

16 OK 1 cork
1 Varnish cracks
6 wiring

Prints

5 OK, 11 Prints No cracks

Special Planks

Salmon Plank spreaded in
#782 Blank (reg 719 blank)

Blank

#744 - 3 $\frac{1}{2}$ -1 \odot

#766 - Wood dry in oven \checkmark \odot

#767 - ~~Schly~~ Resin. \odot 100%

#768 - ~~Schly~~ Resin and dry wood

#770 \times with reg Varnish gun \odot

#771 - 50% recompound and 50% reg. \odot

#772 - 75% recompound and 25% reg. \odot

#773 \times $\frac{1}{2}$ fume and $\frac{1}{2}$ Pair \odot

#776 - baked 1 hr in oven 220°F

#717 -

#780 25% ground blank 75% reg

#781 100% ground blank

Varnish

#764, 1% fume, \odot

#765 5% water \odot

#769 reg with schly, fume \odot \checkmark

#771 reg without Pair \odot

#775 reg with wash Pair \odot

#776 reg with soft Pair \odot

#777 with Schly Pair \odot

#778 with 1% Pair \odot

#755

#756

#757

#758

#779 50% more fume than Pair \odot Pair

3/26/14

Special blanks

744: (35 to 1) blanks 82 made
632-150 Varnish 63.0K

Transfer use reg. schedul 15 - 500 lb

16 OK 8 con. 39 Dis 20%

Dis. due to making sp. in scraper on
lid dropping

1 Dis chipped in handling

17 Dis for blister on one side

Printing use reg. schedul

print 20 in all
8 OK 5 poor 8 cracked

Special blanks # 768

112 in all Reg. use and Reg. use

Transfer use reg. schedul 15 - 500 lb
Varnish 632-150

112 Transfer made

34 OK 19 con 62 Dis

49 Dis due to making the blank
in scraper, and lid dropping

1 Dis cracked

5 Dis with blisters I think due mostly to
holly sp. in transfer press

0 Dis on back side

Printing use reg. schedul
print 50 in all

17 OK 22 poor print 11 cracked

3/26/14 Special Banks

#770 blanks *Low*

832-150 Varnish

Transfer use reg. schedul 10-500 lb

27 made

19 OK 12 2nd 66 Dis. 17%

Dis 55 of this dis. lay to the making of the blanks, rather to the scraper or putting on the lid





margins soft

Printed 31 use reg. set

9 OK 18 poor print 4 cracked

Transfer

6, blister  on side

1, blister  on bot side as 

A do to uneven transfer

767 blanks

#767 blanks

832-150 Varnish

Transfer 104 use reg. set, 10-500 lb

25 OK

8 2nd

71 Dis. 24%

4065 do to making rather in scraper of id to lid dropping

31 Dis for blister 1 2 with blister on both side

11 Dis with cork center

Printed 33 use reg. set

11 OK 13 poor print 9 cracked

#766 Banks

632-147 Varnish
made 132 thin ^{up} use reg sch
15 oz 60+ lbs

29 OK 15 ^{2nd} 88 ^{21%} ~~2nd~~

Printing 44 use reg sch

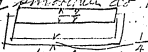
24 OK 16 per pint 4 cr.

for blister

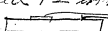
3/30/14


Special on Blister

On our powder blunts, one side is
away from the do. to the mould



I thought this may be the cause
of our blisters.

I marked 12 and transfer
then,  ^{paper}

5 had blister on bright side
6 had " " dull side 
Bright side down

I will test this

3/27/14

775 Varnish (King)

Transfer use reg. schedule
made 538

OK 104 Dis 234

Printing
Serials 104
OK 98 Prof print 8 Check 8

3/31/14

776 Blanks

Blanks baked 1 hr at 220 F°
instead of $\frac{1}{2}$ hr at 220 F°

Transfer use reg. schedule
made 200 517
OK 102
Dis 95

Print 102
OK 76
prof print 22
aachua 1

Special 9/2/11
#774 Varnish (King)

Transfer use reg. schedule
made 177 } over repair
OK 71 } 201 mm
Tilt 3 } 40% 128 Bubbles
Dec 103 } 5 Rmsh
3 Pint
2 Cracked
mended
106 Bubbles
204 mm
21 good
mended

Printed use reg #55
Print 74
OK 55
Poor Print 14
Cracked 5

Severe Blunt 3/2/11
#773 Blanks Varnish 654-100
Transfer use reg. schedule 15-500
made 163
OK 30
Tilt 12 25%
Dec 121

Print use reg #55
Print 42
OK 26
Cracked 4
Poor Print 12

Special Plank #776.

Transfer use reg. schedule 13-500

Varms/6 692-150

made 200

OK 102

Fine 0

Kis 92

57%

Printed use 455 sets

OK 102

OK 116

per, print 22

cracked 4

Lay #1 run 2 4/11/14

Day work

run #1

1-45-75°	7-0-80°
2-0-70°	7-15-145°
2-15-80°	7-30-160°
2-30-90°	7-45-170°
3-0-90°	10-15-175°
3-15-95°	10-30-180°
3-30-100°	10-45-185°
3-45-100°	11-15-195°
4-0-110°	11-30-200°
4-15-110°	11-45-200°
4-30-110°	12-0-200°
4-45-120°	

Lay #2 run 3 4/11/14

4-30-80	7-0-100
4-45-98	7-15-100
5-0-96	7-30-101
5-15-87	
5-30-90	
5-45-92	
6-0-94	
6-15-94	
6-30-97	
6-45-98	

130

Lay #2

#2 lay run 2 1/2
Steam gauge 19 lbs
in two hours 1225

4/2/14

about
700 lbs
of power
to a drum

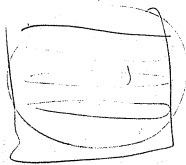
15

1115-78
1130-90
1145-92
12-92
1215-94
1230-100
1245-106
1-186
115-122
130-124
145-140

slows 2.010

2 1/2

after over 1000



4/9/14

ground up Transpu blanks

#771 { 50% of ground blanks
50% of reg. powder

Transpu on reg. schedule 15-500
made 61
OK 46 Dis 15 { 75%

Print 46	{	6 margin
OK 36		8 cook center
Post paid 7		2 inner flake
cracked 3		1 crack

Old Wood flower 4/8/14

The blanks with old wood flower
which is fine are burning him
from now on

See results

4/7/14
 Special Varnish # 779-1738
 Colours & on (Jin of Apr 674)
 try 50% more fuel thermal in manual

flooding of varnish
 No. of flats flooded 690

No 3,40

apex baked		
OK flats 214	Dis	16 raised
min " 336		3 cracked covers
Bubbles " 8		2 dirt
558		67 missing
112		24 Bubbles
		112 Dis

Transfer use reg schedule 15-500
 made 274. Dis 49 both centers
 OK 155 Dis 54 thin margin
 Dis 179 (61% 4 blisters
 2 cracked
 2 back frame flimsy

Printed use reg schedule #55
 Print 155
 OK 144
 P print 9
 cracked 2

7/9/14
Camp Loading

#13 Exp. set scrapings 1813

made 23 blunders

Marked M. } week 12

1 Rag " R }
to back 2 in. down

Transfer now #55 schedule

#1A

7/9/16

Blank loading

#15 powder, brass primed 12. Blank
with case powder rounds
Transfer on #21 Spun, High work

New
Round

7 - OK

1 - OK with not lined.

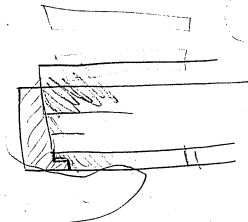
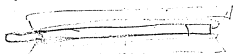
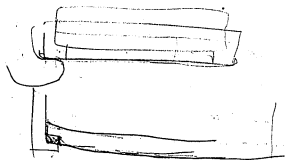
4 - Dis for thin margin

#15 powder brass primed 12. Blank
with case powder rounds
Transfer on #21 Spun, High work

Old
Round

3 - OK

9 - Dis for thin margin



4/9/14 #15.90
 Packing Powder Blend
 Exp by pouring powder in
 moulds by means of a short

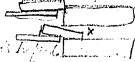


Press #9

I also noted when mould were
 plaster on shelves and pushed
 in from that mould bumped
 filler to press or griped.

Inspected this

mould - to see what happened



- 1 OK
- 2 OK
- 3 X Margu
- 4 X OK
- 5 Margu
- 6 OK
- 7 X Margu
- 8 X OK
- 9 X OK
- 10 X Margu
- 11 OK

12 X Margu

All marked X are molds
 dropped from shelf to
platform

Press #9

one round loaded in the
 reg way.

12 in all

11 OK

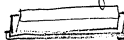
1 Margu Dis

This proved that the short is not
 improved over its reg way.

#16 Exp Powder blank

#7 Jaws.

This Exp is to handle the mould
without disturbing the cadaver.



Can cover in

bottom of mould

Transfer use reg #55-Schedule
varnish 632-109-B

OK 5 one with a cork
center

Dis 7

5 with margin
1 margin $\frac{3}{4}$ cork
1 cork center
1 margin $\frac{3}{4}$ cork

Reg may same varnish 632-109-B

OK 6

all low center

Dis 6

5 margin
1 margin $\frac{3}{4}$ cork

I can't see anything in this

#17 Exp 15 Apr 17

I have reduced the speed of the
hammers down to 60 fpm
was running 83 fpm

hammers running 60 fpm
Vannish 632-179-B } 15 fpm J
OK 6 Bal. 6 Marjins }
2 of margin cracked.

Transfers use #55. Reduced 15-500

hammers running 83 fpm } 20 fpm J
Vannish 632-179-B }

Reg. fac. long

OK 3

Luis 9

7 margin
2 low centers
and cracks



I will Dub this

Exp

60 fpm has not any
odd centers

will require scrapers

I think this will give use good results

7/16/19

#784 Blank
Transfer
Blank

#790 2 egg, Blank
Transfer reg #55
Dry 3 1/2 in Vac. Oven

Push

#791 made reg Blank
Transfer reg #55
Dry 3 in Vac. Oven

Push

Blanks

#792 made reg Blank
W/1/2 reg

#795 2 hrs in Vac dry Blank

#796 3 1/2 hrs in Vac dry Blank

#79A Varnish

100% more Blanks,

{ 60 flats

#79A Varnish Transfer 24 ms 10-500
OK 3 21

{ 3 thin Hugs
2 blisters
1 Bird
1 low center
1 full out

Cracks and foot print

3/12/14 Records 5308
 cracks 595
 foot print 1103
1703

Varnish 632
 Lot 118-19-2

3/13/14 Records 5798
 cracks 505
 foot print 669
1174

Varnish 632
 Lot 122-123

3/14/14 Records 2890
 cracks 237
 foot print 272
509

Varnish 632
 Lot 124

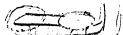
Cracks and foot print

3/16/14 Records 3874
 cracks 267
 foot print 467
734

Varnish 632
 Lot 125-26

7/16/14 Thightman blanks

Use #4 press after flats being
level up.
use #15 loader handles 60 ft
did not put molds over corner
of shelves.
use card in handling moulds
from loader to lid of press.



test of bowls 50%

24 made

Transfer 24 use #55 sch.

OK Conn Dis

20 3 Mugs 1 fluster

Print 20 use #55 sch.

OK

17

Pop gun

4/17/14 Thightman 4. PM

blanks made from press #4
24 made with old mould

Transfer 24 use reg. 55 sch. 15-604

OK

23

Dis

1. High margin

24 made with New mould

OK

22

Dis

1 cook

1 cracked

Blanks #719 reg. Varnish 632-189.2

Old Moulds

34 Printed

OK 20

Dis { 2 cracked
2 poor print

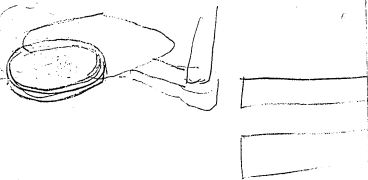
New Moulds

24 Printed

OK 18

Dis { 4 poor prints
2 cracked

Special Blank,
801.



Exp on Scrapen 4/20/14

Scrapen #35

#15 Dress

Transp 632-198-a NG

500 lbs

#19 OK 11

2nd 1

margin

#20 OK 10

2nd 2

Varnish 778

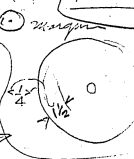
OK 9 2nd 3

Scrapen #36

500 lbs

OK 10 2nd 2

(Print 80 0.01)
OK 4 1
7



Exp on Scrapen 4/21/14

Scrapen #36

#4 Dress

Transp 632-198-B

msr 15 4.500

OK 11

2nd 1 Copy sent

Print

msr #55 Schuman

OK

2nd

Print

2nd

11/11

0

1/2

0

High work #7 print

#719

Transp #632-202

made 48, 15-500 lbs

OK 46

2nd 1

2nd 1

4/21/14
Special Bank #796
3 1/2 hrs in Dyer

Transfer 46 ms 15-500

OK 28 Dis 18

1 cork center
5 blister
12 margin

Prints

Blank #795
2 hrs in Dyer
Transfer 32 ms 15-500

OK 9

Dis 29
12 thin margin
14 blister
4 cork center

4/21/14
Special Bank #719

Face of serial demand
779 Kabinish

Transfer ms #10 15 ms 500 (65)

OK
1

Dis

1 blister
1 not filed
1 " "
1 thin margin
1 blister
1 thin margin
1 cork center
1 " "
1 thin margin
1 cork center

Special Bakid Blank #799
#799 powder 2 hrs at 260 instea of
30 min. as req.

Transp. 99 m. 15-600

OK 71 28 1/2 12 thin K
71% 3 blister
1 bird
12 Crash

Prose

4/22/12
Special Serapi #36 #4
#719 blank
powder 44% fine

Reg blanks
Transf. #5 prints
ndr 15-500

#108p, Bason Sched 1/22/41

GA on Powder, Pres

Sched. No contract up 1200 bl
#4 print when at 1200. Turned on
Stems No. 11. Trans. 1000

Feb. 25. 1941 #719 Notabaka

Transf. #5

Transf. also reg. 15-500
Varnish 299-201-B

12 made

11 OK Ind 1

See 0

Prints

12 OK

No. 1000

No. 1000 print.

100% in Transf.
100% in Prints

Good

#10. Schedul for powder press

#3 press #719 at 200 lbs

Transfer no 632-200 a Varnish
15-500 lbs.
12 arride

8 OK 2 Mid Dis { 2 blister

Print

OK No poor Print Dis 1 crack

#10 Schedul
#4 press with 26 scraper

OK Mid Dis
9 1 cool, 1 Cook Anter
1 blister

Print

OK 10 No poor print

4/27/14
#10 Schedul
15 P. press } #719 blank
35 scraper
Not baked

Transfer no 632-200 a Varnish
15-500 lbs

12 OK

Printing #55 schedul

12 OK

all good fill on margin
2 fine cracked on margin

100 %



4/22/14

#10 Schenck on P. presser
#719 Blank


24 made
#15 Presser
#35 Surfer

Transfer 24 use 15-500 lb.
Varnish 632-203 7 blocks

OK 24

Printed use #55

OK	Comm.	Cracks	pp	St
17	4 small margin cracks	0	3	0



Blank 719 form A 27

#798 4/110 in Green

7/23/14

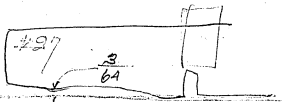
#10 Sch. at 1000 lbs
20 mins. not baked

Transfer use 15-500 lb.

OK 10

Dis

2 blank cracked



Sub Master 7/23/14

Exp Mr Edison

use reg. thermoplastic

Painted

1 mm

heat 314°F at 400 lbs
on press with 7" cone

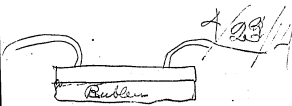
"Paint at 120°F heat
use pressure
time —

35 scrap

#9 use 500 gr 7 layer ribbon
pressed 300

#10 use straight scrap
500 gr. 6 layer ribbon
pressed 200

#11 use straight scrap
and hammers.
500 gr 6 layer
pressed 200



#1 Exp.

#2 Exp.

#3 Exp with hammers 150 gr.
then scraped off

#4

#5 Exp use 7 layers of ribbon
put in press 500 lbs. 150 gr
all with 35 scrap

#6 use 475 gr. 7 layer of ribbon
put in press 400 lbs

#7 use 475 gr 7 layer of ribbon
put in press 300 lbs then drawing

#8 use 500 gr 7 layer of ribbon
put in press 500 lbs

A/23/14

- #3 P/p Transfer OK
Print OK
- #4 " Transfer OK
Print OK
- 5 " Transfer OK
Print OK
- 6 " Transfer OK
Print OK
- 7 " Transfer OK
Print OK
- 9 " Transfer OK
Print OK
- 10 " Transfer Red dot side
Print OK

Scrimmer 100%
Print 40%

Exp P/Model #1



Shear off 50 grs
making the blank 400 grs.

19

#2



has been turned down
Rund

4/22/14

719 Blanks

Powder press #15

Scraper #35

Made 124 blanks

Transf press 15-500 lb

Varnish 779-205-B

134 OK Dis 10 93%

Print

{
OK 10
PP 1
Scraper 1

719 Blanks

4/29/14

Exp on scraper 35
press #15 - 1200 lb 4-22-14

Transf press 12 use 15-500 lb
Press 5 Varnish 779-205-B

OK 12 Ind 0 Dis 0

" 12 " 0 " 0

" 12 " 0 " 0

Transf #13

OK 12 Ind 0 Dis 0

Transf #8

OK 12 Ind 1 amb C Dis 0

Transf press 12

OK 10 Ind 0 Dis 1 cracked

Transf press 18

OK 10 Ind 0 Dis 2 blisters

Transf press 13 scraper 36

OK 10 Ind 0 Dis 1 cracked
1 blister

Transf press 5 scraper 36

OK 10 Ind 0 Dis 1 crack thru
2 blisters on one
1 crack on another
11

(1473)

4/25/14

Serap 37

2
64

36

228	227	231
4	2	2
233		

37

221	227
4	2
241	

38

227
4
230

39

224	229
4	2
230	

40

228	230
4	2
232	

41

228	227
4	2
230	

Transfere

Fante margin



257	254	250	253	257
4	2	2	2	2
254		257		246

Punto



Transfere

241	257	250
4	2	2
257	266	250

Punto



42 Planks

43

44

$\begin{array}{r} 230 \\ 232 \overline{) 230} \\ \underline{232} \end{array}$	$\begin{array}{r} 231 \\ 232 \overline{) 231} \\ \underline{232} \end{array}$	$\begin{array}{r} 225 \\ 232 \overline{) 225} \\ \underline{232} \end{array}$
\$ 234	\$ 235	\$ 231

Transfer

$\begin{array}{r} 250 \\ 251 \overline{) 249} \\ \underline{251} \end{array}$	$\begin{array}{r} 251 \\ 252 \overline{) 251} \\ \underline{252} \end{array}$	$\begin{array}{r} 242 \\ 251 \overline{) 242} \\ \underline{251} \end{array}$
\$ 255	\$ 253	\$ 257

Print

7/30/14
Loading in blank

the rifle powder to prep.

30, to place lid on water

rolled.

1, to in press 300 lb

30, to remove rubber

1, to separate powder off

30, to put lid on.

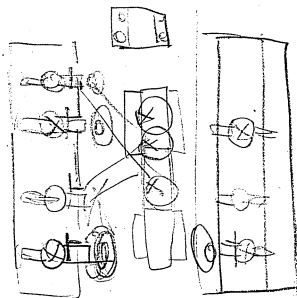
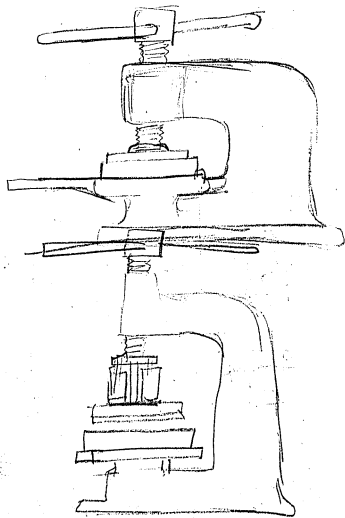
I think this is all.

4/30/14

$\frac{1}{16}$ Latex rings

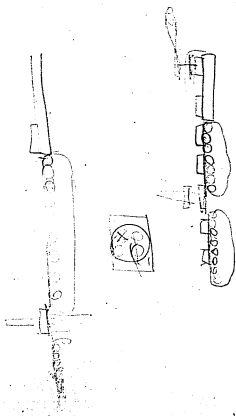
$\frac{3}{16}$ Press ring

$\frac{1}{32}$ 4/30/14



131

Change made in experimental
press. working with only one
die instead of two



5/11/14



Went to #225

205 209

#224

209 207

237 236

Over #6

Fans in over slaps,
dampen close of

5/14

Specie Vannin

#803 Vannin

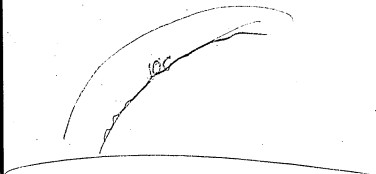
Varmst 632

Wt	Made	R T	Via	Flard	Via	Calculated	70
250	5/12/14	86	3.15	5/12/14	4.27		85
251	"	82	2.45	"	3.11		89
255	5/13/14	78	2.52	5/13/14	2.52		86
256	"	78	3.47	5/13/14	4.02		81
257	5/14/14	77	2.10	5/14/14	2.52		82
258	"	84	2.30	"	2.58		88
259	5/15/14	80	3.22	5/14/14	3.56		90
260	"	88	3.23	"	3.42		81
265	5/16/14	78	3.35	5/16/14	4.30		85
266	"	88	3.30	"	4.39		78
268	5/18/14	80	3.30	5/18/14	5.47		78
269	"	96	3.33	"	4.07		70
270	5/19/14	84	3.18	5/19/14	3.40		70
271	5/20/14	97	3.45	"	3.01		88
273	5/20/14	84	3.30	5/21/14	4.34		74
274	"	98	3.50	"	4.11		68
275	5/21/14	90	3.35	5/21/14	5.30		65
276	5/21/14	98	3.30	"	3.41		"
277	"	98	3.15	"	2.57		77
278	"	"	"	"	5.18		
279	5/22/14	86	3.33	5/22/14	4.16		71
280	"	100	3.18	"	5.04		74
282	5/23/14	94	3.37	5/23/14	5.35		63
283	"	94	3.00	"	5.50		79

Vannish

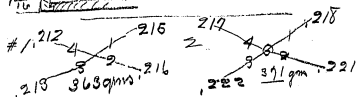
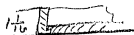
Lat	Made	R T	Via	Flood	Vie	Date	Thurf	%
284	5/25/11	84	3.00	5/25/11	5.01			76
285	"	98	3.35	"	5.37			51
287	5/26/11	89	3.28	5/26/11	5.51			50
288	"	103	3.46	"	6.19			49
289	5/27/11	98	3.36	5/27/11	7.30			51
290	5/27/11	108	3.58	"	5.08			
293	5/28/11	86	3.40	5/28/11	5.00			
294	"	94	3.00	"	4.04			
296	5/29/11	82	3.12	5/29/11	5.10			

5/30/14
Making of River bank
Stem to be 100 lbs. in
pressing that is we will
use 100 lbs on gauge



6/2/14

New packing for blanks #842
blanks made from rings $1\frac{1}{16}$ high.



- 3, 220 - 212 Weight 361 gms
- 4, 221 - 218 " 370 "
- 5, 220 - 215 " 366 "
- 6, 225 - 220 " 375 "
- 7, 219 - 218 " 372 "

blanks made from rings $1\frac{1}{2}$ high



- 1, 210 - 208 Weight 356 gms
- 2, 210 - 206 " 356 "
- Hot water powder
- 5, 227 - 215
- 6, 218 - 218
- 7, 215 - 212
- 8, 230 - 222

XXB-A #842

Water Heat powder
 $1\frac{1}{16}$ ring

- 8, 235 - 228
- 9, 229 - 222

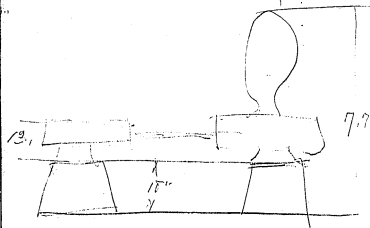
6/15/14

New blanks

Scraping on actin. 40 mld
 Rubber packing in mld. 15 mld

6/15/14

Rubber packing of
 should handle to press, pressed
 " " " " Scraping machine
 # 1 time 26
 # 2 " 20
 # 3 " 27
 Scraping machine 40 mld
 lid dropper 30 mld

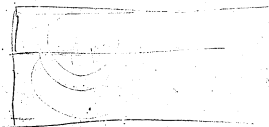
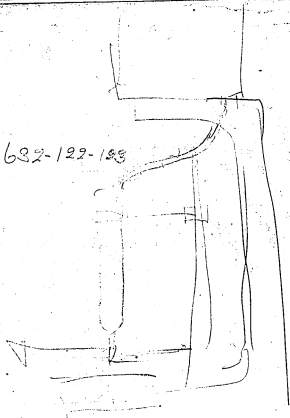


Grande letter 9/31/24 3.000

4.000



632-122-123



[ITEM(S) FOUND IN BOOK]

After loading - Pass to pieces - pieces -
 take to shoring 26 seconds -
 2nd test 20 "
 3 " 27 "

Shoring - Shoring in pass - pieces -
 taking out of pieces ready for
 man - 15 seconds -

Loading 1 min -
 1 man uses 2 loaders -

Shoring - 1 round passes shoring
 in 1 min 20 sec - or with the
 other round on side - we get
 2 in 1 min 20 sec

Done 1/2 min

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- Record Varnish Books
Notebook, N-14-05-14**

This notebook was used during May 1914 by an assistant in the chemical laboratory named Davis (possibly W. B. Davis, author of N-20-07-27 [unselected]). The entries relate to experiments to prevent wave formation on records while varnishing. Most of this work involved the use of various resinous compounds, particularly phenolic resin. Some entries refer to a "Mr. T. A. E. idea," while others indicate that something was given to Edison for further experimentation. The flyleaf is inscribed "Note book of Mr. Davis." The front cover is marked "Davis." The book contains 5 numbered pages followed by approximately 25 unnumbered pages.

May 5 - 14

M. Y. S. idea

Draw and stand for about 1 hour.

Then cover flask with a wire gauze
and heat at the same time drawing to vacuum.

100 mm - 120° F.
200 " - 130 "
300 " - 124 "
400 " - 124 "
500 " - 124 "

May 5 - 14

2

Trying to dry the phenolic resin, which is in alcoholic sol. and flows over nickel plate.

at present these films are flooded ~~over~~ allowed to stand for about 1 hour, then put into a dryer and heated for 7 hours at about 220° F. On the removal of these plates from the dryer the resin film has dried in so waves.

The object of these experiments is to prevent the wave formation.

The average viscosity of the resin solution = 4.00

The diameter of the disk =

The volume of alcohol in solution or 1 solvent =

The thickness of the dry resin film =

① The object of this experiment is to remove the alcohol, as quickly and as thoroughly as possible before applying heat.

Draw and transfer directly to vacuum. pull 5" for 2 hours

" 2" for 2 hours

" 5" for 2 hours

" 10" for 2 hours

" 20" for 2 hours

" 26" for 2 hours

Then heat for 1 hour 100° F. - 130° F. after which gradually increase heat and observe at different stages every 15 minutes =

May 5-13

Two plates which had been flowed, and stood for two days.

No. 1 was just a thin layer of Machine oil.

put into oven at a temp of 140°F at 3.20

220°F at 4.20

Heated for 15 minutes between $220-240^{\circ}\text{F}$, this length of time rendered them perfectly hard, when cold.

If any difference, I should say, the one without oil was the better of the two.

③ With the object of leaving the R.R. of the alcohol, took 20°C of the same solution, and distilled with 10°C S.G. (allowed to stand over night)

Heater to 40°C - 8.10

70°C - 9.10

170°F - 9.35 OK

200°F - 9.55 Traces of ripples forming

245°F 11.05 when done

But developed ripples on suddenly removing from heat.

heat.

They seemed to be allowed to cool in apparatus gradually.

④ The same as ③ only allowed to cool in both gradually.

Distilled - 11.20 A.M. - allowed to stand until 2.00 - 3.00 hours

then heated as above, and allowed to cool without removing from the oven. Distilled 1.50 to heat finished at 2.20 at temp of 240°F .

(4)

May 6 - 1954

Flowed 1 plate with resin which had stood on ice overnight.

" " " fresh solution.

Allowed to stand for 1 hour.

Transferred to vacuum -

9:25 - poured $\frac{1}{2}$ " - $\frac{1}{2}$ hour	} 3 hours
9:55 - " 1" - $\frac{1}{2}$ hour	
10:25 - " 10" - $\frac{1}{2}$ hour	
10:55 - " 20" - $\frac{1}{2}$ hour	

Turned off vacuum pump.

and heated for 1 hour at 120-130 - started 11:25

" " "	12:25	} 4 hours
" " "	12:55	
170-180 - "	12:55	} 4 1/2 hours
220 - "	12:55	
	12:55	} 5 hours
	12:55	

Turned off heat and allowed to remain.

in oven to anneal until fairly cool.

Total time
5 hours

The plates which were flowed with the solution which had stood over night were poor.

Those which were flowed with new solution were fairly good.

This experiment was performed with the idea that the plates should be annealed.

after standing over night these good ones proved to wrinkle very badly.

(5)

Flamed with regular varnish and allowed to stand for 24 hours.
put it on oven at 230°F . and retained it 4 minutes. For
brown, cooled in oven. (hg.)

(6)

Painted some with wax in a water glass, and ~~heated~~
heated.

(7)

Flamed a plate with 20% of varnish allowed to dry and
heated directly to the desired temp. of 230°F . (hg.)

(8)

Flamed with 2 1/2% Copal added, allowed to stand 24 hours
then heated.

(9)

Flamed with 5% Pine added, allowed to stand 24 hours
then heated.

The preparation of *p*-chloro-aniline = $C_6H_4ClNH_2$ (114)

1- mono-chloro-benzene = C_6H_5Cl -

As the action of HNO_3 on benzene in presence of a catalyst

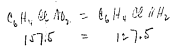
gives rise to a mixture of products, and can be directed
quite well.

2- *p*-chloro-nitro-benzene = $C_6H_4ClNO_2$ (114)

This is the salt the α -compound is formed by the
nitration of mono-chloro-benzene.

3- *p*-chloro-aniline = $C_6H_4ClNH_2$ (114)

This can be found also by the reduction of *p*-chloro-
nitro-benzene.



Therefore 100 gm. of *p*-chloro-nitro-benzene should give
theoretically 80 gm. of *p*-chloro-aniline.

May 4-16

Preparation of *p*-chloro-aniline

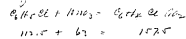
Initiated mono-chloro-benzene -

$\left\{ \begin{array}{l} 150 \text{ gm. } C_6H_5Cl \\ 100 \text{ " } = HNO_3 \\ 50 \text{ " } = C_6H_5Cl \end{array} \right.$

Initiated for 1 hour at $60^\circ C$.

After completion of reaction, removal of the HNO_3 by pouring on

From the follow formula:-



Though 100 gm. of mono-chloro-benzene, should theoretically
give 140 gm. of the mixed nitro compounds.

This experiment was performed with just C_6H_5Cl .

From the above reaction 50 gm. C_6H_5Cl would require
exactly 90 gm. of $C_6H_5NO_2$ of 1.42 sp. gr. -

Not 50 gm. C_6H_5Cl } heated for 1 hour, in boiling
100 = C_6H_5Cl } water, hardly any nitro-
compound was formed.

(ng.)

Total weight of Nitro-Compounds = 37 gms

100 gm. *Amelanchier*
100 gm. *Shrub, common*

The mass of the compound = 1.47 gm. and the mass of the pure compound = 1.47 gm. \therefore the mass of the pure compound = 1.47 gm. \therefore the mass of the pure compound = 1.47 gm. \therefore the mass of the pure compound = 1.47 gm.

$$f_{\mathcal{H}}^{\mathcal{H}}(x) = \frac{1}{2} \left(\frac{1}{2} \right)^{\frac{1}{2}} \left(\frac{1}{2} \right)^{\frac{1}{2}} = \frac{1}{4}$$

Very soon after I was taken to the hospital.

Reddish green, *multicostata* *Orphanidea* *cost.*

16.2055
11.9052
33.12

20% - 95% alcohol

16% *costata*

May 21

fraction of *Orphanidea* *costata*

small parts *Orphanidea* and *costata*, mixed in a lot of
which is *Orphanidea* *costata*, and also in a lot of *costata*

a few *Orphanidea* *costata*

about 1/2 *Orphanidea* *costata* and 1/2 *costata*

May 21 Ba 32 75.3500 20.2000
75.7500 11.9052
2.5060 5.5817

Rep. 4.5.2. 100

May 26 Ba 32 75.7540 25.7930
72.8032 11.9052
2.9508 7.6827

Rep. 4.5.2. 100

375 gm. will rep. 150 gm. Ba 32
175 gm. Ba 32



Has gone to make a 10% alcohol solution from the Pt. Dist. 10% 12.5 gm Pt. Dist. & 100% 92% alcohol.

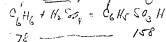
To the 100% alcohol as added 6.2 gm of Pt. Dist. in the weighed amount to ~~from the~~ ^{from the} Pt. Dist. and find the result.

Not sure H_2SO_4 only contains 10% H_2SO_4 - then 5.0 gm of the Conc. H_2SO_4 is required.

requiring a large quantity.

5.0 gm. Benzene SO_3 Benzene distillate for 12 hours
5.0 gm. Benzene SO_3 Benzene distillate for 12 hours
I used the circular design, which weighed
(Cupful Comp. 700 gm. 700H - 500 gm H_2SO_4)
(Spongy Benzol 393 " " - 400 " Benzol)

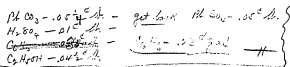
Therefore 107 gm of Benzol was used.



76

158

Therefore from the 107 gm of Benzol used, I should get
about 216 gm of $\text{C}_6\text{H}_5\text{SO}_3\text{H}$
or 497 " of $(\text{C}_6\text{H}_5\text{SO}_3)\text{Ph}$.



20 357 - 500 gm. Benzol 22.47 gm. H_2SO_4

500 gm. $\text{H}_2\text{CO}_3 - .05\% - 5.00$

100 gm. $\text{H}_2\text{SO}_4 - .05\% - 5.00$

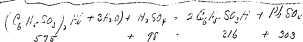
52.47 gm. $\text{H}_2\text{CO}_3 - .05\% - 17.96$

127.17

Not giving the correct amount of H_2SO_4 required to
Saponify the free acid from the Pt. Dist.

100 gm. H_2SO_4

15.9335 13.4127 2.5208	15.7575 13.4127 2.3448	15.4585 13.4127 2.0458
------------------------------	------------------------------	------------------------------



The amount of Ph. salt to take to make a 10% solution of the acid
 316 : 575 = 10 : 18.25 Ph. salt to 100
 (5 take 18.5 gm for 100)

The amount of acid to dissolve in 100 alcohol to liberate
 to acid from 18.25 of the Ph. salt.



made 50%

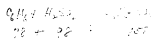
92.5 gm $(C_6H_5SO_3)_2PH$
 17.5 gm $C_6H_5SO_3H$
 50% Alcohol (denatured)

approximately 10% solution - given to Mr. I.Q.B.

19.6720
 16.6490

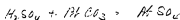
Found weights of $C_6H_5SO_3H$ and $C_6H_5SO_3Na$ in 100 gm. - 800 gm of water taken

Weight of acid salt	360 gm	} Then for 100 gm $C_6H_5SO_3H$ Caustic soda 20 gm $C_6H_5SO_3H$ in 8 hours heating and 100 gm. standing
Weight of alcohol	240 gm	
	600 gm	



98 : 196 = 20 : 40.5 gm $C_6H_5SO_3H$ to 100 acid

98 : 98 = 40.5 : 50.8 gm H_2SO_4 to form $C_6H_5SO_3H$
 49.2 gm H_2SO_4 unutilized.



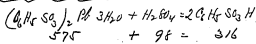
98 + 367

98 : 367 : 49.2 = 184.3 gm H_2SO_4 to neutralize free acid



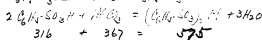
316 + 367 = 521

316 : 367 : 40.5 = 47.9 gm to form the Ph. salt.



575 : 98 : 73.6 = 12.15 gm acid to form Organic Acid

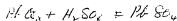
Amount of Am. H_2SO_4 taken ————— 100 ——— @ ——— 0.19 g.
 Amount of $C_6H_5Cl_3$ used ————— 20 ——— @ ——— 0.05 g.
 Amount of $C_6H_5Cl_3$ formed ————— 40.5 ———
 Amount of H_2O_2 used for neutralizing free acid ——— 184.3 ——— @
 Amount of H_2O_2 used to form $(C_6H_5SO_3)_2Pt$ ——— 47.0 ——— @
 Amount of H_2SO_4 used to combine with the
 Pt of the $(C_6H_5SO_3)_2Pt$ liberating
 the free acid ——— 12.5 ——— @ ——— 0.19 g.
 Amount of Pt. acid formed ————— 73.6 ———



$$316 + 367 = 575$$

367 : 575 : 47 : 73.6 gm. of the Pt. acid containing H_2O

There used a total of 231.3 gm. $Pt. Cl_2$



$$367 + 98 = 303$$

367 : 303 : 231.3 : 190.9 lbs. $PtSO_4$ left

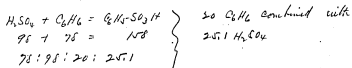
A solution in alcohol is not white washed.

Amount of H_2SO_4 used ————— 100
 Amount of $C_6H_5Cl_3$ used ————— 20
 Amount of $PtCl_2$ used to neutralize free acid — 244.3
 Amount of $C_6H_5SO_3H$ formed ————— 40.5

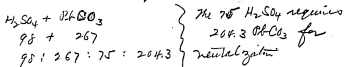
Heated the mixture on the H_2O -bath for 8 1/2 hours, then
 allowed to stand over night. Reprecipitated in the morning
 diluted with about 10 times its volume of H_2O , and
 neutralized the free acid with the calculated amount of
 H_2O_2 required, filtered and concentrated the filtrate on
 the H_2O -bath until a large crop of crystals were formed
 these on standing rapidly assumed the liquid state,
 due to their exceedingly hygroscopic property.

over

100 H_2SO_4 dissolved 20 C_6H_6



There were 100.0 H_2SO_4 taken,
25.1 " combined



1 midget-2-naphthol-2-sulfonic acid - $C_{10}H_6O_4S_2H$
 α -naphthol - 1 part } heated on water-bath for 1 hour
 Con. H_2SO_4 - 2 parts }

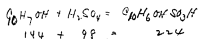
Distill with H_2O , neutralize the free acid with the required amount of K_2CO_3 , and filter. Concentrate the filtrate on the water-bath, and then pour into a saturated sol. of KCl , (which is hot.) when the acid separates out.

Solubility in 95% alcohol.

2-Naphthol-3-Sulphinic Acid

10-2-Naphthol-6-Sulphinic acid - Barbitin - 2-859
2-Naphthol-3-Sulphinic Acid - Water

10-2-Naphthol - 1 part } heated on water-bath for 1 hour
Con. H_2SO_4 - 2 parts }



Torr { 30 gm $C_{10}H_7OH$ }
 { 60 gm H_2SO_4 } 144 : 98 : 30 : 20.4 gm H_2SO_4 req.

60 gm H_2SO_4 taken
20 " " used
40 " " to neutralize.



98 : 267 : 40 : 109 gm $PtCl_3$ to neutralize the free acid

Alginic sulphonic acid - $C_8H_6O_9 \cdot C_8H_6O_9 \cdot SO_3H$

Heat 2 parts alginin with forming H_2SO_4 at 130-140
Orange yellow crystals. Soluble in conc. and H_2O .

If no separation occurs from the acid sol.

Neutralize the free acid with $PtCO_2$ - filter

Then add $PtCO_2$ to the filtrate, forming the Pt salt, which is insoluble in H_2O .

The Pt salt with the excess of H_2O_2 is decomposed with H_2SO_4 (which is in a small amount of the) and the acid try to crystallize from this conc. sol.

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- Cylinder Books**

These three notebooks were used by John P. Constable, Sherwood T. (Sam) Moore, and James Toy in 1914 and 1918-1921 for notes on experiments to improve Edison's cylinder records. These books indicate that the inventor was still interested in the cylinder format as late as 1920. One book contains notes and drawings relating to various possible improvements in the Model X Amberola. Another contains entries pertaining to the press used to make Blue Amberol cylinders and the printing schedule for these records. Also included are notes on experiments dealing with the composition of cylinder records.

One book has been partially selected for indications of Edison's involvement.

N-Number Labels and Inscriptions on Front Cover

Selected Book

20-10-25 "706-x-1"

Books Not Selected

14-06-01	"June 1st 1914. John P. Constable New Model X Amberola. Mr Cook"
18-12-12	—

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- Cylinder Books
Notebook, N-20-10-25**

This notebook was used in 1920-1921 by James Toy for notes on experiments to improve the quality of Blue Amberol cylinder records. These experiments, which were carried out under Edison's directions, illustrate the inventor's commitment to the cylinder format as late as 1920-1921. The experiments involved a variety of materials, including rubber cement, linseed oil, and collodion. A note by Toy bearing a response from Edison, as well as some brief instructions by Edison, have been taped into the book. The front cover is labeled "706-x-1." The book contains 139 numbered pages followed by approximately 50 unnumbered pages.

Only the two pages with Edison notations have been selected.

12/1

S

to 7.

12/1

12/1

Dec. 9, 1920. A.M.
Try Asphalt
alone ^{with clay} — Shellac ditto.

Mr. Edison

Σ

The collection arrived
yesterday noon and I have
prepared some of the blanks
as per your directions. Will
try a couple on the press
this morning unless given
other instructions; simply to
get more information regarding
the properties of the clay-rubber
cement-asphalt mixture.

Blanks from tube slightly underaged
mounted upon applying pressure — no
impression except label.

J. Toy

12-73

Sell American - Prime Celandine

10/10 1967

10/10 1967

10/10 1967

10/10 1967

10/10 1967

10/10 1967

10/10 1967

10/10 1967

10/10 1967

10/10 1967

10/10 1967

10/10 1967

If you have much
trouble with Britches,
you can mix a lot
of wood pulp flow

£

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- F. Detlef Disc Books**

These three books were used in 1920 and 1921 by Frank Detlef, Jr., for notes on experiments on the plating solution used in producing disc records and in the master plating process. There are also references to work done by Ludwig F. (Louis) Ott and Howard F. Redford. Some of the entries consist of a day-to-day record of analysis of the plating solutions and electrolyte control for the Disc Record Plating Department. Also included are experiments regarding attempts to improve the plating process by increasing the speed, substituting different types of plating, and casting a wax or plaster backing (instead of copper) for the thin nickel face plated from the master. The books contain some work on experimental disc composition by Detlef. Notations in two books indicate that Detlef was reporting directly to Edison.

Portions of the first book have been selected as a representative sample.

N-Number

Labels and Inscriptions on Front Cover

Selected Book

20-01-05

Books Not Selected

20-05-19

"Apr. 1920 F. Detlef"

20-12-01

"F. Detl,ef" [sic]

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- F. Detlef Disc Books
Notebook, N-20-01-05**

This notebook was used by F. Detlef, Jr., during January-September 1920 as a daily record of analysis of electrolytes used in disc record plating. Detlef took samples and calculated specific gravity, acidity, and the amount of nickel, copper, iron, and aluminum. Inserted into the book are two notes by Edison regarding items to which he wanted Detlef to pay attention. Detlef refers to Edison's oversight at several points with phrases such as "Mr. Edison says" or "keep Mr. Edison informed." There are also references to work by Ludwig F. (Louis) Ott, as well as some loose notes [not selected] in Ott's hand. The flyleaf is marked "F. Detlef Book #2 - on Electrolyte Control for the Disc Record plating dept." The pages are unnumbered. Approximately 125 pages have been used.

The entries from January have been selected as a representative sample. Several loose notes by Edison have also been selected.

F. DeLef

#2 - on Electrolyte Control
for the Rice Record plotting
dept.

Standard Solutions

Made Jan. 7, 1920.

N/10 K₂Cr₂O₇ - 1 c.c. = 0.005625 gms Fe

N/10 Na₂S₂O₃ - 1 c.c. = 0.006866 gms Cu
1 c.c. = 0.006494 gms K₂H₂O₈

HgNO₃ solution - 3 gms HgNO₃ per liter
that is 1.9050 gms Hg per liter

K₂Cr₂O₇ that is 192.50 X .27193 = 0.5180 x 665 M

KOH sol. - 1 c.c. = 0.012238 gms. Ni = standard

NaOH sol. 1/7/20

47.4 = 40 c.c. K₂Cr₂O₇ } 11.85 Hg per 1 c.c. K₂Cr₂O₇

47.4 = 40 c.c. K₂Cr₂O₇ }

1 c.c. K₂Cr₂O₇ = 0.0061386

KOH and 5/5/20 1 c.c. KOH = 12.75 c.c. HgNO₃

1 c.c. KOH = 0.0066048 gms Ni

NaOH K₂Cr₂O₇ - 0.02972 gms H₂SO₄ per
(C.P.D. & analysis) c.c.

KCN Sol.

44.0 = 4 c.c.

1 c.c. KCN = 11 c.c. AgNO₃

1 c.c. KCN = .0056983 grams N_i

Normal NaOH = Normal H₂SO₄

25.00 c.c. = 25.00 c.c.

25.00 c.c. = 25.00 c.c.

E.C.D. H₂SO₄ = Normal NaOH

26.50 c.c. = 25.00 c.c.

26.50 c.c. = 25.00 c.c.

E.C.D. 10.5053 grams H₂SO₄ = 1.0304 Normal

25.00 c.c. 1.0304 N = 25.00 c.c. NaOH + H₂SO₄

1.0922 Normal

1 c.c. H₂SO₄ = 0.04370 grams NaOH +
0.05356 grams H₂SO₄

$$\begin{array}{r}
 9.9 \\
 105354 \overline{) 100000.0} \\
 \underline{48180} \\
 518140
 \end{array}$$

$$\begin{array}{r}
 18.9 \\
 05354 \overline{) 100000} \\
 \underline{12494} \\
 46460 \\
 \underline{42832} \\
 36280
 \end{array}$$

1900

These solutions made week
of Aug 16 - 21, 1920.

Normal H_2SO_4 : 1 c.c. = .04370 grams $NaOH$
Factor = 1.0922 1 c.c. = .05356 grams H_2SO_4

Normal $NaOH$ = 1 c.c. = .05356 grams H_2SO_4
Factor = 1.0922 1 c.c. = .04370 grams $NaOH$
1 c.c. = .06556 grams Acetic acid

N/10 $NaOH$: made from the Normal $NaOH$
1 c.c. = .005356 grams H_2SO_4
1 c.c. = .004370 grams $NaOH$
1 c.c. = .006556 grams Acetic acid

N/10 Na_2SO_3 - 1 c.c. = .006945 grams
Factor = 1.0925 1 c.c. = .006558 grams Acetic acid
1 c.c. = .005358 grams H_2SO_4

KCM solution - 40 c.c. KCM = 42.7 c.c. $Hg NO_3$

1 c.c. KCM = 10.67 c.c. $Hg NO_3$

1 c.c. KCM = 0.0055273 grams Ni

Sample Taken Jan. 4, 1920
9 A.M.

Cu. = 0.3 c.c. $\text{Na}_2\text{S}_2\text{O}_3$ 100 c.c. sample

0.06866 X .3 X 10 = .020598

Hi = 50 c.c. diluted to 500 \Rightarrow 500 c.c.

Taken = .5 c.c. sample

43.15 c.c. KCN

.012438 X 43.15 X 200 = 105.619

Hi

Acidity = 6.5 c.c. $\text{Na}_2\text{S}_2\text{O}_3$ 200 c.c. sample

.006484 X 6.5 X 40 = 1.689

HCl , H_2O

Iron = 125.632 100 c.c. sample

12.5434

.0198 (F. of) .06

10 c.c. $\text{K}_2\text{Cr}_2\text{O}_7$.005625 X 10 = .056

Aluminum =

100 c.c. sample

.0198
- .008075

.011825

.5303

45424

5303

.006257471 X 10 = .06322

Sample Taken Jan. 4, 1920

9 A.M.

Spec. Grav. = 1.267

Acidity = 1.6889 gms. HCl , H_2O per liter

Nickel = 105.6149 gms. per liter

Copper = 102.19 gms. per liter

Iron = 105.6 gms. per liter

Aluminum = 106.3 gms. per liter

Sample taken Jan. 7, 1920
at 8.45 A.M.

Cu = 0.15 c.c. $\text{Na}_2\text{S}_2\text{O}_3 \times 10 \times .006866$
= 0.10 gms. Cu per liter

Ni = 44.45 KCM.
44.40 KCM.

Acidity = 7.45 c.c. $\text{Na}_2\text{S}_2\text{O}_3$
= 0.6484 x 7.45 v.40 =

Iron 12.5783
12.5390

.0393 (FeO) $\times 10$
 $3.55 \text{ c.c. } \text{K}_2\text{Cr}_2\text{O}_7 \times .005625 \times 10 = 0.2000$
 $0.2000 \times 1.4298 = 0.286$

Alum
.0393
- .0286

.0107
- .0303

- .0196

4.3390
4.3390

0.056742 x 10 = .057

Sample taken Jan. 7, 1920
at 8.45 A.M.

Spec. Grav. = 1.277
Acidity = 1.932 gms. HCl & H_2SO_4 per liter
Nickel = 109.083 " per liter
Copper = .010 " " "
Iron = .200 " " "
Aluminum = .057 " " "

14.8742

14.5416

3326 Ni. glycerine.

2032

6642
9978
6652

$\times 0.675843$ Ni. in 0.625 c.c. sample
 $\times 1600$

40550592
6758432

108134912 Ni. per liter

Sample taken Jan 9, 1920
at 8.30 A.M.

Cu = $0.2062 \text{ gms } \text{H}_2\text{SO}_4 \times 10 \times .006866 =$
 $.014 \text{ gms Cu per liter}$

N. = $48.225 - 5 \text{ c.c.} = 47.8 \text{ c.c. KCN}$
 $48.200 - 40 \text{ c.c.} = 47.86$
 47.83 c.c. KCN

$47.83 \times 400 \times .0061386 = 117.444$

Acidity = $6.1 \text{ c.c. } \text{H}_2\text{SO}_4$
 $6.1 \times .006484 \times 40 = 1.582$

Iron = 17.5476
 17.5368

$.0108 (\text{Fe}) / .06$
 $1.1 \text{ c.c. } \text{K}_2\text{Cr}_2\text{O}_7 \times .005225 \times 107.063$

Alum = $.0108 (\text{Fe}) / .06$
 $-.0088 \text{ Fe}_2\text{O}_3$
 $.0020 \text{ Al}_2\text{O}_3 \times 15.303 \times 10 =$
 $.011 \text{ Al}$

Sample taken Jan 9, 1920
at 8.30 A.M.

Spec. Grav. = 1.296
 Acidity = $1.582 \text{ gms Acetic per liter}$
 Nickel = $117.444 \text{ gms per liter}$
 Copper = $.014 \text{ " " "}$
 Iron = $.862 \text{ " " "}$
 Aluminum = $.011 \text{ " " "}$

Sample taken Jan. 12, 1919
at 9.15 A.M.

Cu = 0.10 c.c. $\text{Na}_2\text{S}_2\text{O}_3 \times .006866 \times 10 =$
.007 gms. Cu.

Mn = 43.5 - .5 = 43.0 c.c. $\text{K}_2\text{Cr}_2\text{O}_7$
43.0 $\times 400 \times .0061386 =$

Acidity = 6.15 c.c. $\text{Na}_2\text{S}_2\text{O}_3 \times 40 \times$
.006484 = 1.578 gms. H_2SO_4

Iron = 17.5456
17.5370

.0086 (FeO) $\times 10$

0.925 c.c. $\text{K}_2\text{Cr}_2\text{O}_7 \times .0086 \times 10 = .052$
.0052 $\times 1.4298 =$

Alum = .0086 (FeO) $\times 10$

-.0074 Fe_2O_3

.0012 Al_2O_3

$\times 1.5303$

.00636 $\times 10 = .006$

Sample taken Jan. 12, 1919
at 9.15 A.M.

Sp. Gr. = 1.267

Acidity = 1.595 gms. H_2SO_4 per liter

Nickel = 105.584 gms. per liter

Copper = .007 " " "

Iron = .052 " " "

Aluminum = .006 " " "

Sample Taken Jan. 14, 1920
at 9:00 A.M.

Cu = .10 c.c. $\text{Na}_2\text{S}_2\text{O}_3 \times .006864 \times 100 = .007$

M = $46.05 - 10.00 = 45.21$
 $45.21 \times .0061386 \times 400 = 111.010$

Acidity = $6.700 \text{ c.c. } \text{Na}_2\text{S}_2\text{O}_3 \times 40 \times .006484 =$

Iron = 12.5516
 12.5564
 $.0154$

$0.80 \text{ c.c. } \text{K}_2\text{Cr}_2\text{O}_7 \times .008615 \times 100 = .045$

Alum = $.0152$
 $.0064$
 $.0088$
 $.003 \times 70 = .047$

Sample taken Jan. 14, 1920
at 9:00 A.M.

Sp. Gr. = 1.280
Acidity = 1.738 gms HCl & H_2O per liter
Nickel = 111.010 gms per liter
Copper = .007 gms " "
Iron = .045 " " "
Aluminum = .047 " " "

$\frac{67}{268}$	$\frac{.006484}{268}$	$1.4 \checkmark 98$
	51872	$.045$
	38904	71490
	12968	57192
	173771	$.0643410$
	$.008615$	
	$.8$	
	$.0045000$	
	$.0088$	
	$.5303$	
	4.424	
	4.454	
	$.046664$	

Sample Taken Jan. 16, 1920
at 9.45 A.M.

Cu = $0.075 \times .006466 \times 100 = .0059$ gms.

Mn:

$4 \times 100 - 4.3 = 41.64$ c.c. KCN
 $41.64 \times 400 \times .0061386 \times 100 = 102.245$ gms.

Acidity = 5.9 c.c. $\text{Na}_2\text{S}_2\text{O}_3$

$5.9 \times 40 \times .006484 = 1.530$

Iron = 11.5436

11.5370

$.0066$

0.75 c.c. $\text{K}_2\text{Cr}_2\text{O}_7 \times .005625 \times 100 = 0.042$

$.0042 \times 1.4298 = .0060$

Alum = $.0060$ $\text{Al}_2\text{Fe} \times 100$

$.0060$ Fe_2O_3

$.0060$ Al_2O_3

$.5303$

$.00031818 \times 100 = .003$

Sample Taken Jan. 16, 1920.
at 9.45 A.M.

Sp. Gr. = 1.258

Acidity = 1.530 gms. H_2SO_4 per liter

Nickel = 102.245 gms. per liter

Copper = $.005$ gms. " "

Iron = $.042$ " " "

Aluminum = $.003$ " " "

$.36$ $.0061386$
 $1185 \mid 730.000$ 41.64
 35557

7450 245544

7110 368316

245544

58

136

$.006484$

400

136

38904

19452

12968

1.530224

$.00625$

7.5

28125

39375

$.0421875$

102.245

400

136

102.245

$.00686$

$.75$

34330

48262

$.00516950$

1.4298

$.0042$

28596

57192

$.00600516$

Sample taken June. 19, 1920
at 8.45 A.M.

$$Ca = 0.05 \text{ c.c. } Na_2SO_4 \times .006866 \times 1.0 = .003$$

$$Mg = 46.55 - 100 \text{ c.c.} = 46.47 \text{ c.c.}$$

$$46.47 \times .0061386 \times 400 = 114.104$$

$$\text{Acidity} = 6.00 \text{ c.c. } Na_2SO_4 \times 40 \times$$

$$.006484 = 1.556$$

$$Iron = 17.544 \checkmark$$

$$\frac{17.536 \checkmark}{.0078 (Feal) \times 100}$$

$$0.90 \text{ c.c. } K_2Cr_2O_7 \times 10 \times .005625 = .051$$

$$.050625 \times 1.4298$$

$$Alum = .0078 (Feal) \times 100$$

$$-.0072 Fe.03$$

$$.0006 \times 1.0 = .006 Al.03$$

$$.0060 \times .5303 = .003 Al$$

Sample taken June. 19, 1920
at 8.45 A.M.

$$Sp. Gr. = 1.284$$

$$\text{Acidity} = 1.556 \text{ gms. Acetic per liter}$$

$$\text{Nickel} = 114.104 \text{ gms per liter}$$

$$\text{Copper} = .003 \text{ " " "}$$

$$Iron = .051 \text{ " " "}$$

$$\text{Aluminum} = .003 \text{ " " "}$$

$$\begin{array}{r} .005625 \\ \times 9 \\ \hline .050625 \\ \times 1.4298 \\ \hline .0723836250 \\ \times 40.5000 \\ \hline 2.905425 \\ 101.5425 \\ 2025.00 \\ 506.25 \\ \hline .0723836250 \end{array}$$

Sample Taken Jan ~1, 1940
at 9:00 A.M.

$$\text{Cu} = .05 \times .006866 \times 10 = .003$$

$$\text{Mn} = 40.5 - 7.7 = 32.85 \text{ C.C.}$$

$$\times 1.0061386 \times 400 = 97.849$$

$$\text{Acidity} = 5.70 \text{ C.C.} \times 40 \times .006484 = 1.478$$

$$\text{Iron} = 17.5465$$

$$17.5358$$

$$.0107 \text{ (Fe)} \times 100$$

$$0.9 \text{ C.C.} \times 108 \times .005625 = .051$$

$$.050625 \times 1.4288 =$$

$$\text{Alum} = .0107 \text{ (Fe)} \times 100$$

$$.0072 \text{ Fe} \times 100$$

$$.0035 \text{ Al} \times 100 =$$

$$\times .5303$$

$$.019$$

Sample Taken Jan ~1, 1940
at 9:00 A.M.

$$\text{H. Ph.} = 1.248$$

$$\text{Acidity} = 1.478 \text{ gms. Acetic Acid}$$

$$\text{Methyl} = 97.849 \text{ gms per liter}$$

$$\text{Copper} = .003 \text{ " " "}$$

$$\text{Iron} = .051 \text{ " " "}$$

$$\text{Aluminum} = .019 \text{ " " "}$$

Sample Taken June 23, 1920
at 9.00 A.M.

$$\text{Cu} = 0.05 \times .00686 \times 10 = .003$$

$$\text{Mn} = 46.25 - 8.00 = 45.57$$

$$\times .0061386 \times 400 = 111.894$$

$$\text{Acidity} = 6.60 \times 40 \times .006484 = 1.712$$

$$\begin{array}{r} \text{Iron} = 12.5552 \\ \underline{12.5362} \\ .0192 \end{array}$$

$$2.200 \times 10 \times .005625 = .124$$

$$.123750 \times 1.4298 \div 10 = .0177$$

$$\begin{array}{r} \text{Alum} = .0192 \\ \underline{.0177} \\ .0015 \text{ Al}_2\text{O}_3 \\ \underline{.5303} \\ 26.515 \\ \underline{53.03} \\ .00079545 \times 10 = .008 \end{array}$$

Sample Taken Jan. 23, 1920
at 9.00 A.M.

$$\text{Sp. Gr.} = 1.279$$

$$\text{Acidity} = 1.712$$

$$\text{Methyl} = 111.894$$

$$\text{Copper} = .003$$

$$\text{Iron} = .124$$

$$\text{Aluminum} = .008$$

Sample taken Jan. 26, 1920

$$Cu = 0.10 \times .006866 \times 10 = .007$$

$$Ni = 49.30 - 4.0 = 45.30 \text{ c.c.}$$

$$45.30 \times .0061386 \times 400 = 110.218$$

$$Acidity = 7.60 \text{ c.c. } N_{40} \times .006866 =$$

$$1.971$$

$$Iron = 125.488$$

$$125.488$$

$$.0126$$

$$14.5 \text{ c.c. } K_2CrO_7 \times 10 \times .005625 = .082$$

$$.008156 \times 14.598 =$$

$$Alum = .0126$$

$$.0117$$

$$.0009$$

$$.5302$$

$$.000477 \times 10 = .005$$

Sample taken Jan. 26, 1920
at 9.00 A.M.

$$Sp. Gr. = 1.296$$

$$Acidity = 1.971 \text{ gms. Acetic Acid per liter}$$

$$Nickel = 120.218 \text{ gms per liter}$$

$$Copper = .007 \text{ " " "}$$

$$Iron = .082 \text{ " " "}$$

$$Aluminum = .005 \text{ " " "}$$

$$11.81 \times 400.0 \times (.33) = .0061386$$

$$3555$$

$$4450$$

$$4896$$

$$4$$

$$19584$$

$$76$$

$$304$$

$$.006484$$

$$304$$

$$25936$$

$$194520$$

$$1971136$$

$$.008156$$

$$1.4298$$

$$65.248$$

$$73404$$

$$16340$$

$$8156$$

$$.000477 \times 10 = .005$$

$$.016614488$$

$$19584$$

$$245544$$

$$491088$$

$$306730$$

$$552474$$

$$61386$$

$$120.2183424$$

$$.006625$$

$$14.5$$

$$28125$$

$$22500$$

$$56250$$

$$.0815625$$

Sample taken Jan. 9, 1920
at 9.15 A.M.

$$\text{Cu.} = 0.10 \times .00666 \times 10 = .007$$

$$\text{M.} = 46.45 - 4.50 = 41.95 \text{ c.c.} \\ \times 400 \times .0061386 = 113.12$$

$$\text{Acidity} = 6.80 \text{ c.c.} \times 40 \times .006484 = \\ 1.764$$

$$\text{Iron} = 12.55 \\ 12.5358$$

$$.0164 \text{ (Fe)} \\ 1.40 \text{ c.c.} \times 10 \times .005625 = \\ .078750 \times 1.4298$$

$$\text{Alum.} = .0164 \\ .0113 \\ .0051 \text{ (Al)} \\ \times .5303$$

$$.5303 \\ 26.514 \\ .0027045 \times 10 = .027$$

Sample taken Jan. 9, 1920
at 9.15 A.M.

$$\text{Sp. Gr.} = 1.278 \\ \text{Acidity} = 1.764 \\ \text{Methyl} = 13.12 \\ \text{Carbon} = .007 \\ \text{Iron} = .079 \\ \text{Aluminum} = .027$$

$$\begin{array}{r} 68 \\ 4 \\ \hline 272 \\ \hline 12968 \\ 45388 \\ 12968 \\ \hline 1.763648 \end{array}$$

$$\begin{array}{r} .005625 \\ 14 \\ \hline 24500 \\ 5625 \\ \hline .07875 \\ 1.4298 \\ \hline 63000 \\ 70875 \\ 15750 \\ 31500 \\ 7875 \\ \hline 1.112596750 \\ .0213 \end{array}$$

[ITEM(S) FOUND IN BOOK]

Delter —

All big Nickel baths
went bad last night due
to Copper —

Got Dougherty up here
& found 181 Milg
per Liter — Why havnt
you seen this coming
from your daily
tests —

Edna

[ITEM(S) FOUND IN BOOK]

Use round the corner

Cathodic + Stirrer

No break wheel -

$2\frac{1}{2}$ amperes for 8 hours

A

$$\begin{array}{r}
 006566 \\
 398 \\
 \hline
 343930 \\
 63198 \\
 \hline
 2052070 \\
 52732070 \\
 \hline
 0.273
 \end{array}$$

[ITEM(S) FOUND IN BOOK]

Req Sol-

1 4 hours

8 "

16 "

Make up Sulfate Copper ^{250 g}
with 2 grams of H_2SO_4

2 7
8 7
12 7
grams per liter H_2SO_4

in each put 3 wax - 4 & 16 hr

3. in without acid
4 8 + 16 hours

[ITEM(S) FOUND IN BOOK]

$$\begin{array}{r} .48823 \\ 4.4792 \\ \hline 87646 \\ 439407 \\ 341761 \\ 195292 \\ 195292 \\ \hline 2.18.6879816 \end{array}$$

109.34

10.00683895178111

$$\begin{array}{r} 895.84 \\ \hline 27352 \\ 54204 \\ 34180 \\ 61842 \\ 52704 \\ \hline 6.12575392 \end{array}$$

6 grams Δ 103 1000
 1.9050 grams Δ 9 " "

$$\begin{array}{r} 3.8-100 \\ \hline 27193 \\ 3.81 \\ \hline 27193 \\ 217544 \\ 81579 \end{array}$$

$$\begin{array}{r} 1.0040360533 \\ \hline 26.4 \end{array}$$

$$\begin{array}{r} 41442132 \\ 62163198 \\ 20721066 \end{array}$$

$$\begin{array}{r} 41.02735180712 \end{array}$$

006838

$$\begin{array}{r} 714 \\ \hline 27352 \\ 6838 \\ 47866 \\ \hline 4882332 \\ 4.4792 \end{array}$$

00683795198M

[ITEM(S) FOUND IN BOOK]

Get Samples of Distilled Water

From Bid. 22 Mr. Aylenorth knows
about it and let us for Mr. Edison's
Request.

Keep the Glycerin Bottles filled up
there is a can under Mr. Edison's Bench
and two new cans which have arrived.

Get Mr. Redford Report to Mr. Andrews
and to Mr. Edison the Free Acid
and Copper in the Nickel Baths also
you report to Mr. Edison and one
copy to Mr. Allington.

[ITEM(S) FOUND IN BOOK]

I have Six Solutions of Butan
in diff. solvents Xylol
Toluol, Diethyl ether,
Methyl alcohol, Trichloroethylene
Chloroform each had 15g Butan
but added 10 more making 25g.
Spun 4 hours in the new tubes
then take viscosity which should
be around 18 seconds then pour
to test cell.
18 seconds is standard from
solution of kerosene.

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments
Miscellaneous Disc Composition Books**

This set of eight loosely related notebooks, which covers the years 1911-1921, contains a variety of experiments relating to the composition of Edison disc records. The experimenters include Charles Dally, Archie D. Hoffman, and W. Jones. The notes indicate that Edward L. Aiken and A. Petit (Ademor N. or Albert O.) worked on related projects. Included are experiments with shellac and various varnishes aimed at improving the discs, with reports on the results and condition of the records printed. Some entries involve the use of alternative materials for the disc blank, such as plaster of paris and paper. Also included are notes on disc manufacture and "transfers," which provide information on the preparation of the blank and details of transfer schedules. Several experiments conducted during World War I pertain to attempts to adjust for shortages of certain ingredients, such as celluloid and lampblack. There are also experiments involving the reuse of discarded discs. The work in N-16-04-26 is related to the experiments in Notebooks by Edison and Other Experimenters--Disc Record Books, Nos. 1-26, while N-20-11-12 is related to the C. T. Dally Disc Blanks Composition Books, Nos. 1-14.

One book containing experiments performed on direct orders from Edison has been selected in its entirety. Another book has been partially selected for indications of Edison's involvement.

N-Number

Labels and Inscriptions on Front Cover

Selected Books

11-04-17.2	"Shellac # 2064"; "W. Jones, Chemical Laboratory"
16-04-26	---

Books Not Selected

12-00-00.4	"Exp on Records with Quick Setting Cement"
12-10-01.3	"Oct 1/1912 Mr. Moore Experimental"
16-11-23	"Celluloid [illegible] #4110"
17-00-00.2	---
20-11-12	"Nov-12-20 Exp. on Reclaiming Records"; "& Substitute for Alcohol Reg Powder"
21-00-00.8	"Tests on Clays For Bulk"

Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments
Miscellaneous Disc Composition Books
Notebook, N-11-04-17.2

This notebook was used by W. Jones in 1911 for notes on experiments involving the shellac used to coat the Edison disc records that would be put on the market in 1912. The object of the experiments was to reduce blisters, smears, and other imperfections. The notes indicate that A. Petit (either Ademor N. or Albert O.) collaborated with Jones on the new disc records. One note by Edison has been inserted into the book. The front cover is labeled "Shellac # 2064" and "W. Jones, Chemical Laboratory." The pages are unnumbered. Approximately 50 pages have been used.

N	lac	3	9
✓	✓	1	9
$\frac{1}{2}$	ST	$\frac{1}{10}$	$\frac{2}{10}$

200 mgms V. Bl.

$\frac{6}{10} \cdot 3$
18

$\frac{1}{3}$

$\frac{1}{10} = 16$
1.6

Reine Co.,

MFG. STATIONERS,
69 FULTON STREET,
NEW YORK.

45009

N-11-04-17.2

1911

April 17

20 gm shellac T. L & Co B + 1 in pin

35% 91% Acet

Boiled ten minutes.

Cooled w. water

Diluted to 2 times volume with cold water and filtered of the solidified wax which rose to the surface. Difficult to filter.

Precipitated the shellac acid by dilute HCl. Light pink ^{highly colored} flocculent ppt. Dried to brown fibrous mass by evaporation.

Made following experiments on reboiling after drying on steam bath.

Found some and while plastic pulled it like molasses candy. This gave a good tough article with ~~tetrachloro~~ ^{trichloro} ~~methane~~ ^{benzene} but condensed too readily. Shellac from which the wax has not been removed does not condense so readily. (Condensation may be prevented by the wax??)

over

Made up a one pound batch.
100 Grs Cornell Borax

1 1/2 lbs shellac

Put in before and pulled the
residual shellac

Made following trials with 1 part
tetrachloroethylene + 3 parts
shellac + the following:

Aniline: keep liquid till aniline
has evaporated.

Pyridine: little better

Dichloroamine: N. C. } little

Naphthalene: N. C. }

Xylolene: too soft

Dimethylamine: same as pyridine

Solvent: best yet

Oil of Amber: This keeps the mass
liquid longer than any of the
others. Combined with tetrachlorine
it gives the best results.
The melt should be kept in
the heat till the gases are
almost all given off when the
mass will be fairly liquid.
Increase in the oil of amber
makes the resultant mass very
elastic.

Oil of Amber + pyridine: This is
even better than the
tetrachlorine which is slightly
brittle.

The oil of Amber + tetrachlor-
ethylene + pyridine + borax
and small pieces of shellac
added. The till pyridine
ceases and let cool till a
drop on paper does not show a
greasy ring.

Residue from distill of Amber Oil.

This did not give good results.
Crude Amber Oil: Same but not
just hard enough. After heating
some minute capsules to
normal.

Rosin Oil (1st Run): Good but does
not keep liquid long enough
Vernice Turps: N. C.

Orthoquinone: N. C.

Unmolding: Too soft. Rubble

Meta-Solvent: No better than
the other gases. Addition
of acetone has no effect

Tried fusing the shellac acids
with metallic salts in fliers.
Lead Acetate: too brittle
Tried following:

I
1 gm diphenylamine
3 gm tetrachloronaphthalene
9 gm ord shellac
Little too soft. Keeps liquid
very few bubbles.

II
1 gm diphenylamine
3.3 gm tetrachloro —
10 gm ord shellac
Better. Still too soft.

III
1 gm diphenylamine
3 2/3 gm tetrachloro — ^{also}
16 gm shellac acids and ^{also} ord
Better in admix. N. G. with acids.

IV
1 gm m-tolylene diamine
3 2/3 gm tetrachloro
16 gm shellac (ordinary)
Absolutely N. G.
Worst fuses together

V
1 gm para-phenylenediamine
3 2/3 gm tetrachloro —
11 gm shellac
N. G. Same as IV

VI
1 gm hexamethyltetramine
3 2/3 gm tetrachloro
11 gm shellac
Very hard and fuses fairly well
but does not stay liquid long
enough.

VII
1 gm tetrachloro (pure base)
3 2/3 gm tetrachloro
10 gm shellac
N. G. Condenses at once

VIII
Same as VI with 3.3 tetrachloro
+ 10 shellac
N. G. condenses.

IX
1 gm diphenylamine
4 gm tetrachloro Good
12 gm shellac ord
Added 1 gm more shellac

The resultant masses from
formulas I, II, III, and IV on
previous page became very hard
on standing over night and were
a little too brittle. No. I was the
best. They stood heat well.
They all seem to decompose much
less on the subsequent remelting.
Tried following to secure more
softness:

IA

1.2 gm diphenylamine
3 gm tetrachloronaphthalene
9 gm ord. shellac

IB

1.3 gm diphenylamine
3 gm tetrachloro-
9 gm ord. shellac

IC

1.1 gm diphenylamine
3 gm tetrachloro-
9 gm shellac

ID

1.05 gm diphenylamine
3 gm tetrachloro-
9 gm shellac

IE ✓

1.5 gm diphenylamine
3 gm tetrachloro
9 gm shellac

These five preparations were
remelted 7 times and allowed to
stand over night. Became almost transparent.

Tried 2-naphthol in place of the
diphenylamine in formula IB.
Kept liquid, gave very few bubbles and
stood remelting 7 times.

Trichloroquinone: N. G. Condensed

Tried pure shellac acid
in place of shellac in all the
preceding formulas and the
masses were finally condensed
over or later, and decomposed
violently.

Continued work with diphenyl-
amine:

IF

1.7 gms diphenylamine
3 gm tetrachloro
9 gm shellac

over

I G

2 gms diphenylamine
3 gm tetrachlor
9 gm shellac

I H

2.5 gms diphenylamine
3 gm tetrachlor
9 gm shellac

I J

3 gms diphenylamine
3 gms tetrachlor
9 gms shellac

I K

3.5 gms diphenylamine
3 gms tetrachlor
9 gms shellac

Made up a 1/2 lb batch for
trial using formula E

1.5 oz diphenylamine
3 oz tetrachlor
9 oz shellac

Strained thru cheese cloth at
130° C. Kept at 120° C for a
few minutes and poured.
Re-melted, kept at 110-115° C +
poured. Made 11.72

I M

Tried the following modifications:

1.1 gm diphenylamine
0.1 gm Borneol
3 gms tetra
9 gms shellac

I N

1 gm diphenylamine
1 gm monobromated camphor
3 gms tetra
9 gms shellac

I O

1 gm diphenylamine
1.5 gm Borneol
3 gm tetra
9 gm shellac

Camphors too volatile.

OVER

Started investigation of the pure
lac acids.

The resin acid exists in the shellac as a monobasic acid. This polymerizes on boiling with caustic alkalis to a tribasic acid. (Benedict & Unger monato. 5-528)

Obtained a quantity of the tribasic acid as follows:

50 gm lac acid

15 gm NaOH

1 l. H₂O.

Boiled for 2 hrs. On precipitating with dil H₂SO₄ a viscous mass separated. Extracted this w. ether.

Distilled off ether. Residue = the impure tribasic acid.

Benzoylated some pure shellac acid by saponifying with NaOH and then boiling this solution under a reflux with benzoyl chloride. At the last a little HCl is added to ppt all the acid. After washing well a rubbery mass is obtained becoming very adhesive on heating and with a slight odor of benzoic acid.

The benzoylated acid condenses after fifteen minutes heating.

Tribasic acid, previous page.

Boiled up the residue with NaOH + added C₂H₅OH and Mg SO₄. A flocculent reddish ppt. came down. This ppt.

was sol. in alc. On filtering a dark red filtrate was obtained containing a resinous substance very sol. in alc. Its Mg. salt was even very sol. in alcohol. On filtering with acid and extracting with Et₂O a viscous light yellow substance was obtained from the filtrate.

The Mg salt remaining on the filter was made into a suspension w. H₂O in a stiff muslin, acidified and extracted w. ether. A dark resinous substance was obtained. A small amt of a black adhesive substance would not dissolve in the ether.

The filtrate on acidifying and heating out with Et₂O yielded

a fairly liquid dark red substance.
Both these resinous substances
condense almost immediately on
heating.

Prepared benzylated and acetylated
lactic acid by reacting upon the Na salt
in the cold with benzyl and acetyl
chlorides respectively. They both are very
adhesive pastes of room substances
which on melting decompose rapidly.

Call the tribasic acid which stayed on filter as insol. Mg. salt, α -resin and the acid which passed into filtrate the β -resin.

Using the decolorized acid made following:

1.5 gm tetra

0.4 gm diphenylamine

Condensed almost immediately

Dinitrobenzol ✓ 3. G.

Resorcin H_2C

Phenoresorcin S. A. C

Perchlorimol N.G

Drosynasthalene N. G

Isobutylene Better

Acetotalidin n. G

Asphensal U. G.

Indranobanol M-G

Anthracene

Shen & Thorne

8-methoxytranslithalene in C

Restambridge 2.

b-anticholinergic N

Exsiccata

Ami Jacobson

Let's - other ed. avoided. If mind, rather. UG

Michael, please

Warmed a portion of monobasic acids with EtOH until these portions till all the alcohol soluble acid had dissolved, & filtered and obtained a dark red filtrate and a gelatinous brown mass on the filter. The latter on drying became a hard dark brown powder, which carbonized at 150°C without melting nor would it dissolve in tetra or in diethylamine or in acetone.

This residue was insol. in EtOH ,
alcohol, H_2SO_4 , slight
amyl alcohol, H_2SO_4 slight and
chloroform.
ether Was sol. in strong
benzol alkalis.
acetone
benzene

Boiled some alcoholic shellac sol. with bone black, filtered, pptd the filtrate w. H_2O and H_2SO_4 drops HCl . Filtered, evaporated filtrate to dryness, extracted residue with ether & on evaporating obtained a very small

quantity of a crystalline substance colorless and crystallizing in fern pattern. Probably lactic acid. Too small amt. to do anything with.

Passed anhydrous NH_3 through a torax sol. of shellac. Changed to a perfect jelly. This jelly soluble in hot water and hot alc. with great ease. Acid ppt. a flocculent light brown viscous substance. This when dried and melted condenses and behaves like the usual lac acids. The ammoniac jelly, when melted first dissolves in its own water and then decomposes.

The Pb , Mn , Mg , Na , Li , Al , Zn , Fe , salts all decompose with frothing.

On leading anhydrous NH_3 through an alcoholic sol. of tribasic β -resin and distilling off the alcohol, a resin is obtained which on heating for some time flows perfectly lumped with absolutely no decomposition and apparently stays liquid for about 2 hrs with steady heat. Resin too soft. The solution becomes quite warm on passing the NH_3 .

The monobasic acid treated as annular monomer does not become warm but turns to a deep cherry red color, dark on evaporating and heating condenses almost at once.

If the alt. solution is boiling while the gas is conducted thru it the resin is much softer and very soluble in H_2O . The monobasic lac acid acts similarly.

On conducting SO_2 thru the tribasic acid a resin is obtained in all respects similar to the above.

Prepared another batch of lac acid but washed them better than the last and did not pull them while soft.

These acids behave much better than the last as regards condensation, although they condense quicker than the raw shellac.

Tried Aniline Violet Base, Induline Blue & Black with lac acid and with shellac. Made very tough masses with acids but they decomposed too much. With shellac they made the mass too brittle.

Using lead stearate and diphenylamine a shellac mass can be kept liquid at 140°C for 35 minutes. (Not long enough)

Separated raw shellac as follows.

over

Raw shellac

1. Soluble in cold alcohol & ether
 2. " " " " not in ether
 3. Insoluble in the usual organic solvents.
 4. Crystalline wax (from hot C_6H_6)
- The resins 1, 2, 3, were very easily decomposed.

No. 1 fused and almost immediately condensed.

No. 2. Decomposed with intumescence.

No. 3. Carbonized without fusion. The wax melted readily to a limpid fluid.

The resin No. 1 when freed from coloring matter was no better.

Separated the lac acids.

1. sol. in cold alc & ether
 2. " " " " most in ether
 3. Insol.
- These resins behaved identically with those from raw shellac.

Raw shellac

On further trial with a sand bath and constant temperature, the resin No. 1 kept liquid for 1 hr. + and solidified with time to a very hard mass having a cut like horn. Good & tough except the bubbles which are very different to get rid of.

Tried the following as solvents in hopes to get rid of the bubbles:

Turp oil	Best. Few bubbles
Dil. acetic acid	Condenses
Dil. HCl	Does not dissolve

Even on precipitating the alcoholic sol. of resin ¹ with water and drying 2 hrs., subsequent melting does not get rid of the bubbles.

On warming shellac with turp oil a large part goes into solution. Filter, dist off main portion of fused oil and heat in sand bath with tallow and lead stearate. Very few bubbles form and keeps very limpid.

On chlorinating alc. sol. of mous-
and triboric acids and resin #1,
evaporating etc, the following results
obtained:

Triboric acid: Heated on sand
bath three days. Became
more viscous each day till
it finally condensed. It never
got harder than tar.

Mono-boric acids: condensed in
a few hrs. Never got harder than
molasses.

Resin #1: Became soft + viscous
after few hrs. heating.

In all cases the solutions were
bleached to a great extent.

On trying the fuel oil method on
a larger scale it appeared
impossible to get rid of the bubbles,
traces of fuel oil being very
difficult to remove without
over heating.

Different Grades of Gum Lac

Made up a batch with 3 to 1 tetra-lac
of following:

Rogers + Payatt

T. N. Rise 15% at 125° for
minutes and found bubbles

(A) showed signs of diminishing
as heating proceeded. Not quite
so fluid as regular. Not good.

R. P. Pure Gurnet: 15% at 125° had to keep at
135° in order to keep sufficiently

(B) fluid. Bubbles tall. Very large.
Peculiar odor. Tougher.

Lacs containing more or less resin
bubbles very tall. Fluid at 140°.

N. C. Condensed Cassey.

The shellacs containing resin fluid
at 125-30 but bubbles pretty badly.

R. P. Extra 22% Very limp. at 125°. If
(C) heated to 135° and allowed to cool
to 125° + poured, usual bubbles.
Superior #1 21% Same as (C).

(D)

Double Δ G 21% Same as (C)

(E)

R+P in a heart: 18% No difference

(F) Diamond R+P: 18% No difference

(C) T.N. Pure 15% ϕ : No difference

(B) Circle R+P: 19% No difference

(J) R+P Superior: 19% No difference

(K) R+P Special: 21 3/4% No difference

(L) If anything slightly more bubble

(C) J.C.: 22 1/2% No difference

(M) V.S.O. 22% No difference

(N) #1 Button Lac Pure: 19% Bubble like Garnet lac, quite large. Has to be kept at 135° at least to keep fluid. Very tough

(P) #1 Louque Louque Button: 18 1/2% This showed up much better than the Garnet or other buttons. Heat to 140-145° & cool to 130° which stirring and very few bubbles comparatively and found

#1 Button Lac: 18 1/2% As far as the best as to bubble when heated to 150° & allowed to cool to 130° and poured. Very limp. This lac was kept at 135-140° C for 1 hr in perfectly limp condition with hardly a bubble, at the end of which time it showed no sign of condensation. This was true both with and without gum stearate. At first a little water comes off but soon it goes gently without any apparent decomposition.

On keeping at 150° C (300° F) the regular working temp. many more bubbles are formed and the mass condenses in 1/2 hr.

Made following modifications with #1 Button Lac

9.0 gm Lac	= Toughest and Best
4 gm Teta	
0.5 gm Stearate	

II

9 gms lac
5 gms tetr
0.5 gms Stearate

III

9 gms lac
6 gms tetr
0.5 gms Stearate

IV

9 gms lac
4 gms tetr
1 gm Stearate

V

9 gms lac
4 gms tetr

1.5 gms Stearate (Excess)
Stearate in excess causes a great many bubbles.
On remelting and peeling below 140° absolutely no bubble appeared in I, II, III. Low in IV and many in V.

Following 6 samples of lac just an. May 5. Put thro same test. as previous ones.

New York Shellac Co.

Button: Very fair. Not as many bubbles after heating few minutes.
135° - 140°

No. 1: Just about same as regular. Possibly a shade less bubbling.

No. 2: Same as regular. } Possibly not
No. 3: Same as regular. } quite as much decomposition

V.S.O.: Same as regular.

Pure T.N.: Same as regular.

Wagel #1 Button Lac (R. P. & Co.)
1 day in boiling water.

Filtrate on evaporation + purification gave a light yellow resin sol. in hot water.

This resin decomposed immediately on steam plate, forming a crumbling mass.

On heating over flame it carbonized with an odor like burning rubber.

The lac resulting from the washing process melts without a single bubble, after the water has been driven off. It should be kept at 135°C . (275°F .) for best results.

Determination of Wax in
#1 Button Lac (R+P)

wt tube + lac	15.3689
" " - lac	13.4638
" lac	1.9051

WT. Beaker + wax	45.1652
" "	45.0765
" Wax	00.0887

% Wax 4.65

The lac was saponified with C.P. NaOH, filtered cold & washed with cold water and cold alcohol. The wax was then dissolved from the filter with boiling benzol into a tared beaker, evaporated, dried and weighed.

The purified residue from the aqueous extract of #1 Button Lac was soluble as follows:

1. Completely in boiling water, causing cloudiness on cooling when conc.
2. Partly in NaOH sol. White residue.
3. Almost insol. in alc. but it cold.
4. Partly in benzol. (44%)

The aqueous sol. is pptd by acids as is also the NaOH sol., making it probable that the substance is of a resinous nature.

Made up a large batch (1-2 lbs) of washed #1 Button Lac, Boiled 1/2 hr with three changes of water, put thro the rolls, powdered, and dried.

Quant. determ. H₂O soluble matter
in #1 Button lac.
Boiled 12 hrs under reflux with
three changes of water.

wt. total + 87.2300

" " - 28.2700

" Lac. used 8.9600

On evap. the washing to dryness a
resinous substance looking like
lac remained but having an
odor suggesting vanillin. On
treating with water, part went
into solution + part remained as
a dark brown with the mechanical
impurities.

A Water soluble

" W & Residue + residue 71.7550

" " 71.4280

" residue 00.3332

B Water insol.

Wt. Residue + residue 44.2990

" " 44.1295

" residue 00.1695

Since both A & B were sol. & passed
thru the filter after the original
extraction, the sum of the

two residues A + B = the total
matter originally extracted from
the lac by water =

.3332
.1695
.5027

% H₂O soluble = 5.61

This represents the net loss in
wt. due to extraction with H₂O.

Made up a large batch of tetra-
lac

3 lbs washed Buttons

1 lb tetra

4.6 oz. stearate

100 mgms Victoria Blue

The V. Blue made the resultant
mass a bright green so added
100 mgms Blue Violet which
changed it to the required blue.
As this mix seemed too soft,
separated into 2 parts of 2 lbs
each and to 1 part added 80%
more of lac, making it 4 to 1.
This hardened the color considerably

The other two lbs left as they were (3-1) for trial. It was more elastic than soft as it was difficult to scratch with the nail but bent like aluminum. Cut like horn. The 4-1 was just as fluid and considerably harder.

Working with Pettit.

Made 10 records from 3-1 and 10 from 4-1. Very hot day (92°F) and both these floppations proved to be too soft. They would not contract from the matrix enough with ordinary cooling. They cemented to the matrix so tightly that when pressure was applied they enclosed air. Tried oiling matrix with amber oil and meaty foot oil. N. F. hot but process impractical as it causes cut to stick to matrix. Best results obtained by shortening

ing the blank + making it quite plastic. This allowed air to escape out ~~under~~ before the wax reached the outlet.

D5-1

Made up 10 records from Button lac using 5-1

34 gms lac

69 gms tere

2 gms stearate

Basic Violet

This was very hard. It shrank out of the matrix without difficulty using fan for cooling. Found blisters on all ten records.

S-31

Made up ten records using Roger Pyatt T. N. Pure K² ^{weighed & dried}.

450 gm lac

150 gm tere

13 1/2 gm stearate

1 1/2 gm Violet

High temp necessary. Drags badly in coating machine. On pressing, these records

showed even better than B 51, than
reproducing surface was also better

SA 31

Treated TN with alc in cold, filtered,
poured into an excess of acidulated
water and boiled till all coag.
Decanted and boiled again.
Repeated 3 times ^{pure water} boiling 12 hrs
in all. Very hard lac having
no oil. I also not resulted.
mixed with a 3-1 regular batch
and made into rec. ls.

This disp crystallized almost instantly.
It dragged back a coating and
appeared to contain small particles
of condensed disp oil dirt.

The crystallization an advantage
as it became extremely hard.

Made a batch with washed
TN $\frac{2}{1/2}$ parts lac
1 part tetra
as follows

A (Best)

22 g lac

8 g 22 gms tetra

20 gms stearate

$\frac{1}{2}$ gm Violet (should

have been about $1\frac{1}{2}$ gms as color
was too light)

Made into rec. ds. Time
85% good.

Made up a large batch with
washed TN

5-lbs lac

2-lbs tetra

10 gms stearate

6 gms Violet

Burn. The sheller was probably
partly condensed by the washing
on the wash roller as it adhered
to the roller badly.

Could not filter as it was too
thick. Bkpts two screens on big
pot. Condensed solid on reheating.
Repeated same formula with
small pot. Only half could
be sucked thru the screen.
On reheating the other half
it condensed finally.

Obtained a batch by careful
heating + gentle filtering
but it condensed in the
coating machine after 12
recs were made.

Will repeat using T.N.
washed as follows in
enamel pots:

Boil gently with asbestos
mat under 1/8 ft. 6 hrs.

Changing the water every
hour and stirring frequently.
Ground in mill and let dry in the
oven air.

Made up a batch C.

2x { 22 gm. lac
84. 22 gm. cryst. tetra.
20 gm. stearate
2 gm. roset

Very difficult to filter as the
shellac contains so much dirt
that it clogs the gauze after
about 1/2 hr. gone thru. This
necessitates reheating the other
half and using another filter.
Ball this batch coming.

was much more fluid and did not
show any signs of condensation.

Made a large batch of crystallized
tetra from Benzol. Centrifuged
the crystals + dried in the air.
The mother liquor contained a lot
of oily matter, probably mono-
chloronaphthalene. In practice
they could be returned to the
chlorinating still.

Pettit has evolved a new scheme
which obviates the melting of the
shellac entirely in the coating
machines.

The dose is reduced to 80 mesh
and the matrix must be
hot. The prod. dose is then
introduced into the matrix
and rolled till there is a
uniform layer on the inside.
The matrix is then spun
and while spinning the hot
wax blank is poured in. The
trouble with regular dose

was that the tetra separated on the surface of the record forming pits.

I made a dope
6 lac
 $\frac{1}{2}$ tetra crystal D
 $\frac{1}{4}$ stearate.

which gave very good results;
no tetra separating.

The batch & merbed C was made up into records of which 80 were made from the whole batch.

~~Since~~ It seems that in larger quantities the dope turns out a shade softer, so made up a batch.

E 2 x { 22 oz lac TN
8 oz 22 gm crystal Tetra
5 gm stearate
2 1/2 gm violet

Some trouble in filtering.

Batch C made a fine smooth set of blanks and from the appearance of the dope at end of run, could have proceeded

indefinitely to coat blanks.

But it was the very important discovery that blisters were due to particles of condensed dope embedded in the surface of the wax blank. We cut open a great number of blistered records and in each case found a rubbery brown mass under the blister. This, being elastic tended to force a small area of the shellac dope outward when the pressure was removed. Mr. Edison was fully convinced that this was the cause of the blisters and immediately ordered new blanks made from new materials.

On pressing the blanks from dope E we obtained no blisters with the exception of 2 very peculiar air bubbles which formed over night under the coatings of

two records. They formed blisters each about one inch in diameter and of a nature never observed before. Possibly due to greasy finger marks on the core.

We also discovered that in the coating, the blank must not be brushed against the gate lip so it forms a gathering of dirt which deposits on the coat on a sumpage that cannot be passed out. If however, the blank be slowly out immediately on closing the gate, no such trouble occurs and from experience we find that a rough coated record gives just as good a repouring surface as a finished blank.

Had a small vacuum melting pot made with 3 screens 50, 160, 300 mesh. These screens for removing the much more effectively without clogging, as shells need no very dirty. Worked well, the different

sizes of dirt particles being plainly noted on the different screens. A large quantity of large particles were retained on the 50 mesh. Will have regular pot made this way.

Tried filtering by melting up the ingredients in a double steam heated pot, the bottom of the inner pot being 100 mesh screen. When fluid the inner pot was slowly drawn up and after about 15 min most of the dirt had passed through. The scheme fails because it was necessary to heat the dirt about 34. Now how to get it liquid enough for filtration and as it takes about 15 min for the dirt to pass the screen, the dirt that has already gone through becomes overheated before it can be poured.

Made the experiment of coating a
polished montan blank with a
very heavy alc. solution of
shellac (drying carefully,
taking 12 hrs and pressing
and results may be obtained!
Push this.

Made a batch of dope with
washed TN

22 g lac
10 g crypt Tetra
5 gm stearate
3 gm violet

F

Strained thru 3 screens. Worked
fine.

This dope very liquid and works well.
We tried a new method of coating
with view to getting rid of blisters
formed by bridging over. We first
dressed the blanks with montan band.
Then gave them a very thin coat of dope.
This coat was then flamed, thus breaking
open all the air bubbles formed by the
air occluded in the surface of
blank. We then gave them the

0004
regular thickness of dope, flamed,
baked and pressed. Not a blister
in the lot (Hawk). Only trouble appeared
to be particles of montan mechanically
picked up by blank before putting in
matrix, and similar due to too
long turning in. Possibly the
similar also due to insufficient
stirring. (Pettit gave orders for a
triple stirrer.)

We also obtained numerous blind
spots caused by the expander coring
the ends of blank too soon and
thus excluding air. (Can fix)
Records from this records were
abright. The color was a little too light.
Will remedy by adding a little nigrosine
to next batch.

My Angles

Experiments to get rid of Sineas:

#1.

6g lac (washed redud T.N.)

2 1/2 g tetra (cryst.)

2 gms stearate

2 gms diethyleneamine (+ violet)

No difference. Sineas appears on burning

#2

6g lac

20g stearate

1/2 g tetra

+ violet

Absolutely no sineas on burning. Molds well. Too soft and crumbly under fing. nail. Seems to cement steel to blank better than anything yet found. No bridging over, very liquid. No pinking on flaming.

#3

6g lac

1 1/2 g stearate

10g tetra

+ violet

Not enough difference in hardness to make practical.

#4

8g lac

10g stearate

2 1/2 g tetra

+ violet

#5

8g lac

1 1/2 g stearate

2 1/2 g tetra

+ violet

#6

but 8g F dope in pot to which added 3/4 g stearate. On long burning before the gate the blank came out perfect. The only sineas being on the surface which may be easily wiped off.

Made batch as follows:

22 g lac
10 g tetra G.
1.5 g stearate
3 gm violet
2 gm spirit black } 2nd color

Coated best yet.

Very fine working qualities
Smear still persists - but can
be wiped off easily.
Little too soft.

Made batch as follows

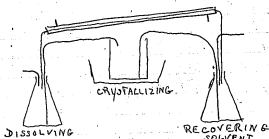
22 g lac
10 g tetra H
10 gm stearate
5 gm violet

Best blacks yet. Seem to get
rid of smear in such large
amounts as before.
Pressed out beautifully (12 records)
Coated blank leaving it moist
surface. Pressed out just as good
as the rest which were furnished

"Mr. Echos suggestion: 'melt the
dope in the pot, put on the screen
and the other pot, invert and
keep warm to see if dope would go
through screens by itself. Tried
this and dope all went through
but it had to be kept so hot for
such a length of time that
the filtered material was
condensed. Tried covering the
pots with asbestos to keep up heat
& as obviate heating while filtering
but it would not go through."

Received instructions from Mr. E. to
lay out a plant for making
1,200 lbs dope a day, and a plant
for crystallizing tetra.

Made a model plant for crystallizing
tetra from CCl₄
(next page) #



Found that 50 cc CCl_4 dissolved 300 gm crude tetra, increasing the volume from 50 cc to 260 cc = 42% by volume.

Had a hell of a time with H. dop. Couldn't make more than 25 records without it condensing. Only explanation is that the boiling in water partly condenses the sheller. Consequently made following

1.
 22g unboiled TN
 10g cryst tetra
 10gm stearate
 5 gm violet
 5 gm. α -naphthylamine

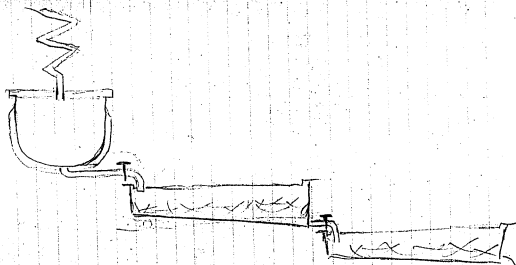
2.

22g TN
 10g cryst tetra
 10gm stearate
 5 gm violet

3.

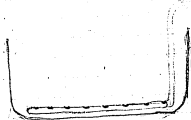
22g TN
 10g regular tetra
 10gm stearate
 5 gm violet

Works fine at 270° F. Costed 34 blanks and last looks good as first. Must be careful to keep temp between 265-275.



To still where the
remains of the
recovered (steam
heat)

W. vapor 200 F
Began to come over 300 F



$$\begin{array}{r}
 3 \\
 51 \\
 48 \\
 \hline
 240 \\
 4165.88 \\
 16 \\
 \hline
 10 \\
 6 \\
 \hline
 20 \\
 1.2
 \end{array}
 \quad
 \begin{array}{r}
 656 \\
 4 \\
 \hline
 24 \\
 16 \\
 \hline
 16 \\
 1000 \\
 96 \\
 20 \\
 \hline
 16.2
 \end{array}$$

20 gm
1.2 gm loss
2.4

1st crop
Distill off half benzol from filtrate
2nd crop
Distill off half benzol
3rd crop
Distill off all benzol & return residue to
chroma still

Shellac wax

50% ceryl + myristyl alc.

50% stearic, palmitic & oleic esters of
same

About 20% of the raw shellac

The resin acid exists as a monobasic
acid. On boiling with NaOH for 2 hrs
it is converted into a tribasic acid.
(Benedict & Ulger)

1 gm pure shellac acid = .066 gm KOH

1 gm tribasic acid = .204 " "

4.07 shellac

1.2

[ITEM(S) FOUND IN BOOK]

Make about 1 lb of
Saponified Shellac ~~then~~
~~it~~ then press it
from the alkali - want
the free acid base
of shellac -

Better try small test
portions before you
make the acid -

I want to get shellac
harder & tougher by get-
rid of the non-essential ingredients?

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments
Miscellaneous Disc Composition Books
Notebook, N-16-04-26**

This notebook was used by Archie D. Hoffman during April 1916 for experiments on disk "transfers" performed on orders from Edison. The experiments have "E" numbers that correspond to the experiment numbers in N-16-03-07 and N-16-04-27, Notebooks by Edison and Other Experimenters—Disc Record Books, Nos. 1-26. The notes provide information on the preparation of the blank, such as varnish details, along with details of transfer schedules, such as temperatures, times, and pressures. The pages are unnumbered. Approximately 30 pages have been used.

485-E

Change 1412 Blanks - Budget.

1412 Blk. - Oct 95

Schedule.

Put at Contact just off pipe
where temperature get to 180° below feet.
no 150 lbs pressure & hold for 5
minutes, then bring pressure to
300 lbs hold for 12 minutes

4/26/11

487-E

Transp 48 1412 blanch's with
reg. 9 lbs. Transp.
The Blanch's to brushed with Turbide
only $\frac{1}{4}$ inch. in - ~~no~~ more -

Then print the whole.
carefully inspect & mark all
defects.

Put $\frac{1}{2}$ of them in Chemical process
& $\frac{1}{2}$ over over for Turbide test.

488-E

Traverse 13-1412 Blazek's
Reg. Yenish plates 9 hrs take
of Blazek's not Bruckel.

Put at Contact a needle just at the fine-
super temperature changes, 180° F. per
psi pressure to 150 lbs hold for 5
Experiments, then run to 300 lbs
hold for 3 minutes hold for 10
minutes, cool.

Worst Edge or Buff.

Finished

491-E

Tracked blanks having no
dimer on -

Transfer the rising req. Ins. plates
+ following schedule

Put at contact quickly just leaving
pin - When temp. reaches 180 Fahr.
put the pressure up to 300 lbs + hold
for 12 minutes, take out at about
135° Fahr.

Temperature on Ins. 12 55 Pt. 400
Ct. 105
2 Red Blister
4 O.K.

4/27/16

489 E

Take 50 1412 bladders Not Binned.

Rays thru through needles over
upper part are found common
plates reg. schedule.

Transfer reg 1412 bladders
Schedule + 96 is results

Take 50 of 96 Lot Bins

4/27/16

491-E

Tracked blower having no
benzene on—

Transfer these passing reg.
Gas plates + following schedule.

Put in contact media just
leaving pur— taken structures
180° Fahr. put the pressure
up to 30 lb for 1/2 minutes,
then cut, 125° Fahr.

4/27/16

491-E

Blower not Brushed.

Take 6 1412 blower, use

Tracked, magnets + print as this
bare blower. use Reg. Transfer
Schedule.

If OK. put Reg. Transfer
on there.

Transfer

4/27/16

493-E

Dup. of 15 Branches
490- 14 1/2 branches
not brushed but Edged 1/32

smaller in Diameter -

Use 485-E Transpo.
Schedule.

Transcribed

4/27/6

494-E

Edge 24 1412 Bands -
 1/8 inch less in diameter
 + make 12 Transpos Bands
 Not mixed.

Use 495-E Labels.

Ed 95-1412 C Blk. In 1953 Ed 400 Bands
 Ed Photos, 10 O.K.

These 12 Bands have been checked
 as follows

- | | |
|----|-------|
| 1 | 9.883 |
| 2 | 9.883 |
| 3 | 9.883 |
| 4 | 9.884 |
| 5 | 9.880 |
| 6 | 9.884 |
| 7 | 9.880 |
| 8 | 9.880 |
| 9 | 9.883 |
| 10 | 9.883 |
| 11 | 9.884 |
| 12 | 9.883 |

4/27/12

495-E

Plot 102-1412.

Case 12-1412 not brushed.

Aluminum, Red Translucent plastic,
put at constant, checked part of
pin, When temperature of
reaches, 180° F. put pressure,
at 390 lbs + hold - 10, 15 minutes
cotl + remove at about 125 F. also

Plot # 102-1412, Plot 1255, Plot 410 Area 5
1 Red Photos, 11 Oils.

496-E

4/27/12
71508 Hancock

Special 1412 blued brushed.
with $1\frac{1}{3}$ Laminar.

Transfer onto Reg. Plates
regular solidified.

Ed 93-1508 Bli. Jan 1955 Ed 200 Notes 5
9 Red Photos 10 O.K.

4/27/16

498-E

Use Reg. 1412 instead of blank
press sheet blank with. Thawed
plates, instead of blank
plates.

Use reg. 1412 schedule
sheet final payment is to be
500 lbs instead of 300 -

4/27/16

499-E

Press 1508 Hoffman Blank
Pushed - 12 Hours

Transfers onto reg plates

Schedule - put in contact
specie just above fire. When
temperature reaches 180° F. stop
put pressure at 300 lbs + hold
for 10 minutes. - cool +
remove at 125° F. later.

At 93.1508 P.H. Use 1055. At 400 P.H. 5
3rd Blow 9 O.K.

4/27/16

500 E

Press Hoffman 1508 Blank
1 1/2 Hrs. W Pushed. -
3

Press Blank with transfer +
Hoffman Blank.

Schedule - put in contact
specie just above fire -
When temperature reaches 180° F. stop
put pressure to 500 lbs + hold
for 10 minutes, cool + remove
at 125° F. later.

4/27/12

501—

Use 1412 Buckled Blanket

Use Special House room
Suits

Reg 1412 Buckled.

Take 24-51

4/28/12

509.E

Open 1412 Buckled 1412
Buckled.—

Use 33 1/2 cc plates on 6 Buckles
+ 15 cc on the other 5 Buckles

These plates are required first

Trayges requires trayges
schedule for 1412 Buckled

4/29/16

1010-E

Use 12 Hylther from 489 E
Dot of Bernard Blauvelt
put on coat of welding Var. on
the 2nd row.

Print direct with regular Muses
Hondels now in use.

Schedule - Bring to Contact
middle of pin - where temperature
reaches 180° Fahr. put pressure to
700 lbs. for 12 min. cool &
run over bottom 125° Fahr.

4/28/16

1011-E

Duplicate of 1010 E

But put 2 coats of varnish on
the 2nd row after each coat.

Use same schedule as in 1010 E

4/27/16

505-E

Duplicate 500 E
young Hoffman 1508 brushed
heads.

Print direct on blank north
Regular French Monks now
in use -

Schedule. Bring to Contact
middle of pin. When temperature
reaches 400° open port 500 lbs
pressure on for 12 minutes
then cool & remove at 125° F. Air

4/28/16

1005-5

1005-E Make 50 Blowing jps. 2 for putting on two coats of Turquoise Dyeing 2 hrs after each coat;

The same cannot be over-
stated, plates with out any
stamp back.

Print 12 blades direct on blades
using regular music machine.
normal use.

Schedule - Bring to Contact
needle just off the pin. When
temperature reaches 180° Fahr. put
pressure at 700 lbs. for 12 minutes,
cool & remove at 125° Fahr.

1020-E

1508-507-E-B

4/28/16

Use 12 blades 1508 but.
1/6 inch thick
1/6 put on 1 coat of brush. Use
blue & blue.

Use 10 French Moulds + 2
brushes Moulds

Schedule - Put at 1000 lbs.
weight of air - When temperature
reaches 180° Fahr. put pressure
to 400 lbs. 10 minutes, cool &
remove at 125°

1003-E

4/29/16

Use 12 blades 1003-E, 1/6 inch
they are 1/4 inch blades.

Put two coats of 1/6 inch on each.
face drying 2 hrs after each coat.

Put direct 15 blades with 1/6
French Moulds

Schedule - Put in 1000 lbs.
with needle of 1/6 inch - When temperature
reaches 180° Fahr. put on 5 1/2 lbs
pressure for 10 minutes, then cool.
Remove at 125° 0° Fahr.

4/29/11

1018-E

Duplicate of 1017

Only change is to cook
down Cold type tubing from
Pres. -

4/27/16

1001-

Take 50 cc 1412 Hanks. Brushed
with 2 coats of Brushing Varnish,
dry two hours before putting on
2nd coat. Hanks 2 hours after
second coat is on.

Save the Hanks + don't mix
them.

Take 12 of these Hanks + print
direct on one Reg available.
Moulds now being used.

Schedule - Put in Contact
fluid just before 7. Hanks temperature
get to 180° F. put on 500 lb pressure and hold
for 12 minutes. Cool + remove at 125° F. air.

4/27/16

1002 F

Use 12 prints of 1001

Print direct on Hanks with the
following schedule.

Put at Contact needle just before -
when temperature reaches 180° F. put
on 500 lb pressure and hold
for 20 minutes. Cool + remove at
125° F. air.

Use Reg Hanks Hanks.

4/29/16

1013-E

Reprint 12. Nuclei Peristoles
ready, but have opportunity.
Cont with 2 copies of Nuclei Peristoles
Nuclei 2 hours lead.

Schedule - Bring to contact
as quickly as possible
Nuclei Peristoles ready 180°F
put on 806 for pressure. 120 min
120 min - Cool + remove at
125°F. 120 min.

4/27/16

1004

Moore has some 1410 Bingham
Bingham - Baked at 150°F for
5 hrs -

Print 12 direct on blanches ready
Reg. Nuclei Peristoles now being
used.

Schedule -
Put at contact quickly
just off the line. - Temperature
ready 180°F. put pressure to
500 lbs for 120 min, cool + remove
at 125°F. 120 min.

Finished at 4/28/16

4/27/6

1007-E

Reprint 12 Worst printed
records, using regression
Models.

Schedule -

Bring to contact till
needle comes off. When temperature
reaches 180°F. put pressure
to 700 lbs for 12 minutes, then
cool & remove at 125°F. min.

4/27/16

1012-E

Duplicate 1001-

But change Schiedt official
pressure is 750 lbs for 12 channels

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- W. W. Dinwiddie Disc Mold Books
[Not Selected]**

These three books were used by William W. Dinwiddie in 1915, 1918, and 1920 for notes on miscellaneous experiments, some loosely related to the "D" experiments in the Dinwiddie Disc Books, to improve the molding of blank disc records. Included are experiments with varied ingredients for the wax and various tests on those waxes. The results often note how the wax melted and how well it loosened from the disc blank mold without melting. Other entries pertain to experiments with the powder in disc composition and its effects on the molds, as well as with various methods of loading the molds. Also included are notes on experiments to reduce wear on the molds and to protect them from excessive pressure from the hard blanks in the mold presses. The problem was eventually resolved by pre-softening the blanks within the presses with steam heat before physical pressure was applied.

N-Number Labels and Inscriptions on Front Cover

15-05-25	"Wax Expts for Submasters W.W. Dinwiddie"; "War"
18-10-09	---
20-03-15	"Blank Loading Machine W.W. Dinwiddie"; "Disc Records"

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- Record Inspection Books
[Not Selected]**

These seven books were used during August-December 1917 by Archie D. Hoffman and an unidentified assistant for statistical records of numbered "E" experiments. Each experiment usually involved a set of printings of a disc. For each printing, there is information about the number of records inspected, the number and percentage of "O.K." records, and the problems with each discarded disc. The reasons given for discard include pull-outs, crushed edges, cracks, and rough spots. Some of the results in these books were transferred to books in Notebooks by Edison and Other Experimenters—Disc Record Books, Nos. 1-26.

<u>Book</u>	<u>N-Number</u>	<u>Labels and Inscriptions on Front Cover</u>
A	17-08-13	"Inspection Reports -- Factory Inspection Book -- A"
B	17-08-31	"Inspection Reports -- Factory Inspection Book -- B"
C	17-09-18	"Inspection -- Reports Factory -- Inspection Book -- C"
D	17-10-06	"Inspection -- Reports Factory -- Inspections Book -- D"
E	17-10-25	"Inspection Inspection -- Reports. Factory -- Inspection Book -- E"
F	17-11-14	"Inspection -- Reports Factory -- Inspection Book -- F"
G	17-12-07	"Inspection -- Reports on Factory -- Inspection. Book -- G"

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- Blank Transfer Inspection Books
[Not Selected]**

These three books were used in 1915 by three unidentified employees for notes regarding the inspection of experimental powder blank transfers. They are probably part of a larger series, the remainder of which is no longer extant. The entries indicate the varnish lot, blank number, oven number, and the reasons for discarding, such as cracks, thin margins, pull-outs, "birds," pin holes, cracked varnish, and mechanical defects. Some of the notes refer to "special" or "commercial," rather than experimental, blanks. The initials next to the dates on some of the entries may be those of the experimenters.

N-Number

Labels and Inscriptions on Front Cover

15-03-26.1

"5"

15-05-11

"8"

15-06-10

"Experimental Powder Blank Transfer Inspection"

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments
Miscellaneous Experiment Books [Not Selected]**

These eight notebooks, which cover the period 1911-1920, encompass a variety of experiments by Zachariah P. Halpin, Albert F. Wurth, and other employees. Included are reports on disc original masters and master molds not completed, data on the printing and transferring of experimental records, and information regarding the quality of printed records. One book describes the physical equipment, mold holders, rotators, and tables used for electroplating. Also included are experiments on improving the wax used in disc records, on the heat in the record manufacturing process, on the springs in recorders and phonographs, and on reproducers. One book contains information about repair of phonograph parts, machine tools needed for phonographs, and the care of phonographs and cabinets. Another has entries on cabinet design, along with tests of mechanical parts, such as turntable springs and governors.

<u>N-Number</u>	<u>Labels and Inscriptions on Front Cover</u>
11-01-02.1	"Reports on Disc Records"
12-10-10	"Z. P. Halpin"
14-07-06	---
14-09-01	" -- Put On -- Presses 1914. Flexible Tubing Record September to 1915"
14-09-23.2	---
16-03-02.1	---
20-06-03	"Laboratory Notes J. McCarthy"
20-11-30	"R. P. Dugliss."

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Group 2: Kinetophone and Kinetoscope Experiments (1911-1914)**

These nineteen notebooks cover the period 1911-1914. They were used by Leroy E. Briggs, William W. Dinwiddie, Harry W. Doyle, Zachariah P. Halpin, Absalom M. Kennedy, James W. Ramsay, and other Edison employees for experiments relating to the development of motion pictures. Included are tests of Edison's home projecting kinetophone, as well as a "professional" variation of the machine. There are also notes pertaining to the kinetophone (motion pictures with sound), including tests to determine the optimal positions of the kinetoscope and phonograph for synchronization and experiments with the disc diaphragm. Other entries describe the development of complete kinetophone and home kinetoscope outfits and demonstrations of the kinetoscope.

In addition, there are experiments to ascertain the best carbon element for the "motion picture machine" and data regarding the use of an incandescent rather than arc lamp. Other entries describe the development of a new lamp house, commutators, lens systems, screens, an automatic film developing machine, and a film drying machine. There are notes on various setups for the developing machine and variations in airflow, blowers, and vents to test the heat regulation. In addition, there are tests of nonflammable film, a paper fastening machine, new film cement, amplifiers, synchronizers, and cameras. Other experimenters who are identified as working on related projects include Adolph F. Gall, Daniel Higham, Charles W. Luhr, Charles W. Norton, Elroy Pearsall, and George J. Werner. Seven books with indications of oversight or involvement by Edison have been selected.

The notebooks are arranged in three subgroups: (1) L. E. Briggs Books (6 notebooks); (2) A. M. Kennedy Books (6 notebooks); (3) Miscellaneous Books (7 notebooks) [not selected].

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Kinetophone and Kinetoscope Experiments -- L. E. Briggs Books**

These six notebooks were used by Leroy E. Briggs during 1913-1914. They provide daily logs of Briggs's work with the home projecting kinetoscope, film developing equipment, and other projects relating to motion pictures. There are also entries on other experiments including a miners' lamp, locomotive headlights, a new lamp house, an automobile electric self-starter, and a frictional microphone. Miller Reese Hutchison directed some of this work, and Briggs produced weekly reports for him. Other employees who are identified as being involved in related projects include Ernest J. Berggren, Walter W. Dinwiddie, Adolph F. Gall, Zachariah P. Halpin, L. E. Hammond, Absalom M. Kennedy, Charles W. Luhr, William H. Meadowcroft, Henry J. S. Rudolf, and Carl H. Wilson.

The two books with indications of oversight by Edison have been selected.

N-Number

Labels and Inscriptions on Front Cover

Selected Books

- 13-03-18.2 "Experiments with Lights, and Lenses in Home
Kinetoscopes. Also Aluminum Screens. L.E. Briggs I
March 18 to May 21, 1913"
13-09-17 "Automatic Machine for Developing, Fixing and Drying
Motion Picture Film. L.E. Briggs SO. 3300"

Books Not Selected

- 13-05-22 "Experiments with Lights, Lenses, and Reflectors in Home
Kinetoscopes. Photometric Measurements, L.E. Briggs II
May 21-Oct 30, '13"
13-11-07 "Book # 3 L. E. Briggs"
13-12-30.2 "Disc Record"
14-06-15 "Storage Battery for Locomotive Elec Headlights June
15. 14, L. E. Briggs"

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Kinetophone and Kinetoscope Experiments -- L. E. Briggs Books
Notebook, N-13-03-18.2**

This notebook was used by Leroy E. Briggs during March-May 1913 mainly for experiments relating to the development of Edison's home projecting kinetoscope. The initial entry describes formulas for a silvering solution for plating glass. The remainder of the book is primarily a daily log of Briggs' work on the kinetoscope; the log is continued in N-13-05-22 [not selected]. Included are experiments aimed at adapting the incandescent lamp for use in the home kinetoscope. Other notes describe the work of Briggs and a machinist named Dennis on the development of an adjustable contact apparatus for the kinetoscope. There are also descriptions of new lamp holders and commutators. Some of the entries in the middle of the book contain data on endurance tests for General Electric bulbs that might be used in the kinetoscope. Other experiments involve the use of a corrugated aluminum screen, reflectors, and various lens systems. In addition, there are experiments to make the telephone receiver in the kinetophone less bulky and better able to fit into a limited space. A series of entries toward the end of the book describes tests of a frictional microphone for train dispatching. Miller Reese Hutchison directed some of this work, and Briggs produced weekly reports for him. The results of some of the experiments were shown directly to Edison, who commented on them and sometimes gave additional instructions. The notes indicate that Briggs consulted or received instructions and assistance from Ernest J. Berggren, Adolph F. Gall, Zachariah P. Halpin, L. E. Hammond, Absalom M. Kennedy, William H. Meadowcroft, Henry J. S. Rudolf, and Carl H. Wilson. The cover is labeled "Experiments with Lights, and Lenses in Home Kinetoscopes. Also Aluminum Screens. L.E. Briggs 1 March 18 to May 21, 1913." The book contains 13 numbered pages followed by approximately 95 unnumbered pages.

Acme Co.,

MFG. STATIONERS,
96 JOHN ST.
AND
19 PLATT ST.
NEW YORK.

54472

L. E. Briggs
Thomas A. Edison
Laboratory

Orange 907 - #175

Book No 1.

March 18, 1913 to May 21, 13

2909 1

Silver Solution for Coating Glass etc.

1. Washing Solution:

16 Grams Stannous Chloride
1000 c.c. distilled water

The washing solution cleans and
prepares the surface to take the
silver coating.

2. Silver Solution:

12 Grams silver nitrate
1000 c.c. distilled water

Add strong ammonia; at first,
solution turns muddy; add more
slowly until solution turns straw
color. Allow to stand 24 hours
and filter.

3. Reducing Solution.

5 c.c. Formic Aldehyde 40%.
250 c.c. Distilled water.

Pour the reducing solution #3
into the silver solution #2 and
dip the glass to be plated into
mixture as soon as possible.

#2909³

Tues. March 18.

To adapt incandescent lamps to
Home Projecting Kinetoscope:

A.M. Top film reel did not wind up
so I readjusted.

1. 30 C.P. Edison Mazda
Concentrated filament lamp set near
the focus of B condenser lens.
Screen 15 ft distant
Image very dim,
2. Same as above except
Screen 10 ft distant
Image little better but still poor,

2909⁷

Tues. March 15

P.M.

Ordered silvering solution
for silvering incandescent
lamp bulb.
Soldered lead connections etc
and connected up.

30 C.P. Mazda Lamp.
Concentrated filament
6 Volt.

Battery of 5 Storage Cells.

Voltage across lamp terminals
light out 6.40 volts
6.30 volts

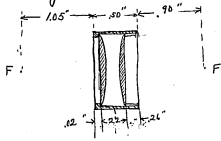
Voltmeter M. 45. No. 9905

2909

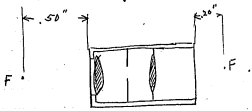
Wed March 19.

Incandescent lighting for Home T.K.

B System lenses



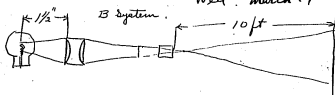
Objective lens.



Above distance between focus and lens barrel was determined by projecting the image of a distant object upon a screen.

2909

Wed. March 19

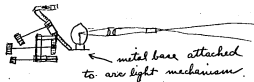


#2909 7

Thurs. March 20/13

Incandescent lighting Home T.K. Machine

A.M. Finished the adjustable holder
for 30 C.P. lamp.



P.M. Tried film "Pony Express"
Screen 15 feet distant
30 C.P. Concentrated filament Mazda lamp.
Picture fairly good.

Tried film "Mike's Hero"
Picture good - faces pretty good.

The lamp used was plain - not
silvered and used without a
reflector.

2909

Thurs March 20, '13
cont'd.

Silvering solution as first
mixed had too much ammonia,
solution was perfectly clear and colorless.
Tried a few experiments with
small quantities in test tubes to
get that straw color. The silver
nitrate solution worked best when
it had the color of a lab coat.

#

More silver nitrate AgNO_3 was
added to first solution.

#2909

Fri. March 21, 13

Small tests to determine
amount of Formic Aldehyde to
Silver Nitrate solution.

Prop.	Formic	AgNO ₃	
1/4-1	4	16	very dark
1/2-1	8	16	"
3/4-1	9	12	"
1-1	10	10	"
1 1/8-1	15	10	"
2-1	16	8	"
2 1/2-1	15	6	no better
3-1	15	5	"
3 1/2-1	14	4	"
4-1	16	4	little better
5-1	20	4	" "

Results of above experiments are
very poor. The Formic Aldehyde
seems to be very weak.

#2909

Fri. March 21, 13

Different proportions of Formic Aldehyde
was added to Silver Nitrate.

Strengths of formic aldehyde

- (1) 3 cc with 120 cc distilled water.
Add (1) to equal quantity of AgNO_3
Silver coating was poor.

- (2) 1 to 50 solution of formic aldehyde
Add a double quantity of solution (2)
to AgNO_3 .

Result: a heavy coating of metallic
silver was deposited on the glass bulb
within 10 minutes, but the silver coating
began to check and crack almost
immediately.

All results of plating were negative.
Mr. Gall said would see me Sat Morning
in regard to having General Electric
silver the lamp bulbs.

#2909.

Sat. March 22, 13

Mr. Gall was not in this morning.

I showed (Mickey Hero) pictures to Mr. Hutchison and he said they were "damn good". He called Mr. Edison who was pleased with the picture and requested us to test the lamps for endurance.

Mr. Hutchison also had Mr. Berggren and Mr. Wilcox in to see the pictures. Both thought results were good.

Mr. Hutchison wants me to make an adjustable holder for him.

Make test runs to determine the life of the lamps.

Measure the current used by lamp.

Go to General Electric Works, Harrison to get 12 - 30 CP. 6-V lamps - silvered.

F.P. #

#2909

Sat. March 22, 13.

In the afternoon I started to make an adjustable holder for the incandescent lamps as requested by Mr. Hutchison.

Stopped work on holder in order to try the incandescent lamps on daylight picture experiment which Halpin is working on. Pictures looked very good upstairs in the laboratory but when taken out in the yard, the pictures were very dim.

#2909

Mon. March 24, 13.

Took 7:46 AM train at Brick Church to Newark. Round trip 15¢

Trolley Newark to Harrison, General Electric Edison Lamp works. Round trip 10¢
Return to Lab. 11:58 fare 5¢.

Mrs. G. H. Stickney and L. C. Porter were not at the works, but Mrs. Sommers attended to my order.

The 30 C.P., 6V - 5 amp; $2\frac{1}{2}$ " dia bulb
and 50 C.P., 6V - 10 amp; $3\frac{3}{4}$ " dia bulb

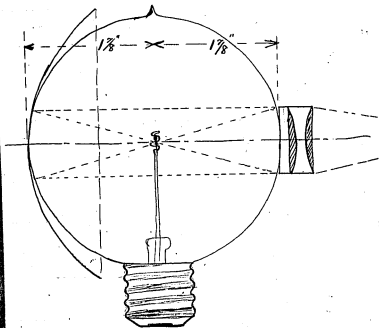
Magda concentrated helix lamps are not yet on the market; consequently no supply of these lamps are kept in store and all orders are made specially to order.

Their best promise was twelve 30 C.P. lamps - silvered one half vertically. to be shipped by express next Monday March 31, 13.

Mr. Sommers claimed that tests had demonstrated that the life of silvered bulbs was shortened.

#2909

Mon March 24, 13



4" Parabolic reflector $1\frac{1}{8}$ " focal length.

50 C.P. 6V-10 amp. Mazda concentrated
helix lamps. $3\frac{3}{4}$ " dia of bulb.

4" Parabolic reflector $1\frac{1}{8}$ " focal length.
to be used with 30 C.P. 6V-5 amp. lamps.

#2909

Mon. March 24, 13

Mr. Hutchison advised me to order
by telephone.

12 - 50 C.T. 6V - 10 amp.

Magda concentrated helix filament
lamps. $\frac{1}{2}$ Bulb to be silvered vertically.

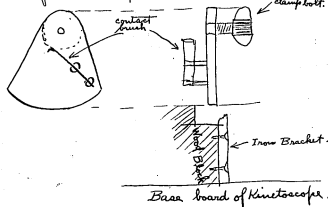
Got Mr. Barnes at G.E. works, telephone
Harrison 2182.

Mr. Hutchison introduced Mr. Dennis
as a machinist who would help me
make adjustable commutator. This
is a contact device made to flash
the incandescent lamps at a high voltage
while the film is stationary and then
contact connection is broken while the
film is moving.

* #2909

Tues. March 25 '13

Mr. Dennis and I made the adjustable contact apparatus to flash the incandescent lamp at extra voltage when the film is stationary and lamp is out when film is moving.



#2909

Wed. March 26, '13.

Set up Kinetoscope and measured voltage and amperes at lamp.

6 storage cells gave 8.2 volts across their terminals. After current passed through commutator, the voltage across lamp was 6 cells 5.7 volts, and 5.3 amp.

8 storage cells readings at lamp.

8 cells 7.3 volts 6.1 amp.

normal voltage of lamp 6 volts.

Commutator adjusted to cut out the current $\frac{1}{4}$ of the time. - Current flows during $\frac{3}{4}$ of total time.

Good motion pictures.

28" x 38"

15 feet distance
B system lenses.

#2909

Wed March 26, 13.

—: Commutation action:—

The commutator is fastened on the flywheel shaft which makes one revolution to each picture.

By actual measurement, the motion of the film required to make one complete change of picture occurred while the fly wheel turned through $\frac{1}{2}$ of a revolution — the film remaining stationary during remaining $\frac{1}{2}$ of the revolution.

Hence if the electric current is broken only while the film is moving, the incandescent lamp will burn at a very intense heat $\frac{1}{2}$ of entire time — thus allowing only about $\frac{1}{2}$ of the time to cool off.

The commutator was made with $\frac{1}{4}$ of its circumference of fibre — thus making it possible to cool the lamp filament during $\frac{1}{4}$ of entire time. By use of a double brush arrangement, this time interval may be shortened any amount desirable — the lamp may even be kept burning without any pause at all.

#2909

Wed. March 26, 13.

Experiment in small dark room.

C system lenses.

30 c.p. lamp $\frac{1}{2}$ silvered vertically

9 storage cells, 8.3 Volta - 6.3 lamp

Good picture 36" x 48"

Mr. Edison thought it good,

Experiment continued in Committee Room.

9 storage cells same as before.

B system lenses

Good picture 54" x 72" (full size facsimile)

Attempt to cover large screen

11 storage cells

C system lenses.

Lamp burnt out - filament did not
break but filament lead melted.

Mr. Hutchinson authorized an ^{oral} order
to have Q. E. Co. make two large
lamps of concentrated helix type. These
will be used to experiment with
incandescent lighting of the large
kinetoscopes.

D.S.V. #2909

Thurs. March 27, 13

Submitted the weekly report to
Mrs. Hutchison.

New improvements in the lamp ^{batter} and
commutator are started under to bring
the complete apparatus in fine working
order for demonstrations when the
new lamps arrive.

Called Mr. L. G. Porter of the G. E.
Lamp Works at Harrison on the
telephone, in regard to special lamps
of high candlepower to be tried in
the large Kinetoscopes.

Lamps of the concentrated helix type
are not made in sizes greater than
50 C.P. because a wire carrying
more than 10 amperes can not be
properly sealed in glass.

Mr. Porter says that their tests
showed the silver coating on the bulb
increased the candlepower very little
while the life was shortened by the reflected
rays being absorbed by the filament.

#2909

Thurs. March 27, 13.

Mr. Porter said that the G. E. Co. is making some special lamps of very high concentration for us. He thought that the first experimental lamp!

[110 volta 120 C.P. with a long bulb - but not a large dia.]

was finished and tested.

Mr. Jackson of the experimental dept. could not be found but Mr. Porter promised to give our order his special attention and to rush as much as possible.

#2909

Friday March 28, 13

Made a new lamp/socket
and holder.
Started on changes in commutator.

#2909

Sat. March 29, 13.

New lamp holder and commutator
finished today, and connections and
adjustments made.

Complete apparatus is ready
for demonstration with the new lamps.

#2907

Mon. March 31, 13.

Home P.K. trials on the large size screen.

C system lenses
30 c.p. concentrated helix lamp.
not silvered.

Current broken during $\frac{1}{4}$ of time.
7 volts (normal is 6 volts)

Very large picture on commercial size screen was dim but pictures on aluminium screen were good.

Mr. Gall saw pictures on both screens.

Mr. Ma Cracken of General Electric Works telephoned the earliest shipping dates:

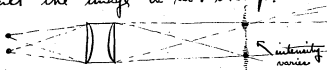
30 c.p. 6V-5 amp — 12 lamps April 7.
50 c.p. 6V-10 amp — 12 " April 5.

#2909

Tues. April 1/13.

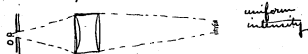
Experiments with the Nernst lamp in the Home Kinetoscope:

The two incandescent bars are two separate light sources. The rays of two sources do not come to the same focus on the screen. As a result the image is not sharp.



If the light source is a point, all the light rays come to the same focus and the image is sharp.

If all light rays except those from one point are cut off by means of an aperture, the image on the screen becomes much sharper.



#2909

Wed. April 2, 13.

Experiments with the Nernst lamp
in the Home Kinetoscope.

Experiments were tried with an aperture about $\frac{1}{8}$ " dia in front of one of the incandescent bars of a Nernst lamp. When the aperture was used, the moving pictures appeared to be in sharper focus than when the picture was illuminated from both of the incandescent bars.

A new aperture plate, the design of which could be used in commercial manufacture, was started.

Question: Is a picture produced by light rays, each ray in a definite direction, propagated through the film, or do the light rays strike the film which then becomes a light source due to the diffusion of the impinging light rays?

This can be settled by varying the distance between the light source and the condenser lens. If the sharpness of the picture is not disturbed thereby, the picture is due to diffused light.

#2909

Thurs. April 3, '13

I spent most of today changing titles in the scenario "Magnatium". This scenario was corrected by Mr. Meadowcroft. We went over the suggested changes and now I have the scenario ready to submit to Mr. Edison.

The aperture for the Nernst lamp was finished but not early enough to permit extended trials.

#2909

Fri. April 7, '13.

Experiment: effect of an aperture
 $\frac{1}{8}$ " dia. in front of a Nernst
lamp.

Two Home Kinetoscopes lighted
with Nernst lamps were used
simultaneously to give a clear
comparison.

Two films "Mike's Hero" were used.

One Kinetoscope had a Nernst
lamp without any obstruction between
it and the condenser lens; The
other machine, exactly the same as
the first, had the aperture $\frac{1}{8}$ " dia.
directly in front of the lamp, thus
allowing the light from a small part
of only one incandescent bar to reach
the condenser lens.

The pictures thrown upon the
screen, side by side, ^{each} about 24 inches
long, were easily compared.

The picture from the machine
using the aperture was the better

#2909

Fri. April 4, '13.

The use of the aperture gives the picture the appearance of much greater depth and sharper focus.

Picture lighted by the regular Nernst lamp was very poor when compared to the picture lighted by the Nernst lamp with an aperture.

Mr. Hutchison and Mr. Gall saw the pictures and both said that pictures from the machine using the aperture were very much better. Neither knew how the lamps were connected up until after they had expressed their opinions.

#2909

Sat. April 5, '13.

Submitted scenario "Magnetism",
revised as per corrections by Mr. Meadowcroft,
and a typewritten suggestion for Ed. Film
Title slides to Mr. Hitchison.

Tried to readjust the copper
brushes on the Home Kinetoscope.
The copper brushes rubbing on the copper
commutator are giving trouble.

Carbon brushes may be necessary
to eliminate the trouble.

#2909

Mon. April 7, 13.

Made a new brush holder for H.P.K. machine. Copper brushes did not work well on the copper commutator.

The new carbon brushes work very good.

I called Mr. Mc. Crackew of the G. E. Co. at Harrison. He said the 50 C.P. and 30 C.P. lamps could not be shipped April 5, 13 as promised but the 30 C.P. lamps will surely be shipped on the 8th, and the 50 C.P. lamps on the 10th.

#2909

Tuesday April 8

Made a special attachment to the arc light mechanism to try a diaphragm between the arc and the condenser.

The diaphragm was $\frac{1}{8}$ " dia and was supported about $\frac{3}{8}$ " to $\frac{1}{2}$ " away from the arc in order to escape the intense heat. The experiment showed, however, that the diaphragm was too far away from the arc either the diaphragm must be closer to the arc, or the diaphragm must be larger.

This experiment was interrupted for the present in order to test the new incandescent lamps which are expected tomorrow.

#2909

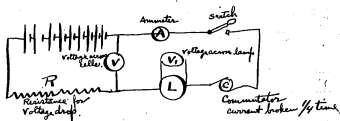
Wed. April 9, 13.

Home Kinetoscope was connected with electric drive:

The flywheel was turned to a V groove and driven directly by belt from an Emerson 1-20 E.C. motor. A small variable resistance in series with the shunt field permits the adjustment of the motor speed.

The complete outfit, kinetoscope, motor, resistance, double throw switch and wire connections for both the motor and the incandescent lamp are mounted upon one base board.

The complete apparatus runs well and endurance runs will be made with the new incandescent lamps.



#2909

Thurs. April 10, 13

Endurance tests of Concentrated helix lamps.
Lamp #1 - 9 storage cells.

Regulation speed - 16 pictures per sec.

Time	Volts at Lamp	Volts at Battery	Ampere	Quality of Picture
------	---------------	------------------	--------	--------------------

4:00 PM	4.1	10.7	4.5	good - 24x36"
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Burnt out after 7.5 minutes?

Helix was exactly in center of bulb but silvering was a little dirty.

This test is doubtful - should be discarded

Friday 11, 13

Lamp #2 - 9 storage cells.

16 pictures per sec.

Helix aimed at image coincides by 2nd

Time	Volts at Lamp	Volts at Battery	Ampere	Quality of Picture
10:15 AM - 11:15 AM to 4:15 PM	9.1	9.5	2.0 K	24x36"
2:00 - 2:45 PM	4.0	9.0	4.4	OK - 24x36"
2:50	4.1	9.0	4.5	OK "
3:1	3.9	9.0	4.3	good "
3:15	3.8	9.0	4.3	good "
4:00	3.9	9.0	4.3	" "
4:30	3.9	8.8	4.3	" "
5:00	3.7	8.8	4.2	" "
5:30	3.8	8.9	4.3	" "

no perceptible blackening of lamp bulb.

7 hours run



#2909

Lamp #2 cont'd.

Sat. Apr. 12, 13

Time	Volts at Lamp.	Volts at Battery	Ampere	Quality of Picture
8:00	4.3	9.3	4.8	good - 3/4 x 2 1/2
8:30	4.2	9.4	4.7	" " "
9:00	4.2	9.3	4.7	" " "
9:30	3.6	9.4	4.5	2 up at lamp due to brush of commutator.
10:00	3.9	9.4	4.6	
10:30	4.8	9.4	4.5	

Continued:

2 1/2 hours

The voltage (average) 4+ is nearly equivalent to normal voltage.

Carbon brushes are increased from 1/4" dia to 1/2" dia.

#2909

Mon April 14, 18

Time	Lamp #2 cont'd.		Amperes	Quality of Picture
	Volts at Lamp	Volts at Battery		
9:00	5.8	10.7	5.9	good 24x36
10:00	5.9	10.5	6.3	" "
	Lamp became very black at end of 1 hour run.			

5.6	8.8	6.0	Commutator
6.9	8.2	6.9	" cut out.

Time	Lamp #3		Amperes	Quality of Picture
	Volts at Lamp	Volts at Battery		
3:00	5.6	8.9	5.8	good 24x36
5:30	5.6	8.9	5.7	" "
7:00	5.7	8.7	5.7	" "
7:30	5.7	8.7	5.7	" "
1 hour	Lamp became a little out of center of bulb. Picture 24x36.			

2909

Mon Night Apr. 14, 13

Lamp # 7

Helix in central - silver dirty.
Normal voltage - constant current 5 cells.
At lamp. - no picture

P.M.	Voltage	Current	Picture
8.20	6.1	5.8	good 24 x 36
9.00	5.9	5.7	" " "
9.30	6.0	5.7	" " "
10.00	6.0	5.7	" " "
10.30	6.1	5.7	" " "

2 hours 10 min (no intermission)
9 30 Mon. 10:30 P.M. to Tues. 8:00 A.M.

Lamp # 7 with 5 cells
8.00 AM 5.8 5.7
10.00 " 6.0 5.7
11.00 " 6.0 5.7
12.00 " 6.1 5.8
1.00 " 6.0 5.7
5.00 " 6.0 5.7

Tues. Apr 15
Resistance adjusted to restore normal voltage.
Intermission off on lead.

9 hours day run Tuesday
2 " 10 min
19 " 30 min
20 hrs 70 min (no intermission)
15 hrs 0 " Tues. 5:00 P.M. to Wed 8 A.M.
35 hrs 40 min Total

night

2909

Wed April 16

Time	Lamp #4 cont'd		Amper.
	Volts at lamp	Volts at cells	
8:00 AM	5.9		5.6
11:00	6.1		5.7
12:00	6.0		5.6
3:00	6.1		5.6
4:00	6.1		5.6
5:30	6.1		5.6

Pt-on 6 cells with
recharge in series and
retired small battery.
Cells becoming black.
Picture 24" x 36" good.

9 hrs	30 min	run Wed.
3 5 "	40 "	
45 hrs	10 min.	

April 17, 13

8-9 AM

2909

Lamp #4

Thurs Apr. 17, '13.

Watched with Gall, Hammond and Kennedy the method of taking a record, and operation of a diaphragm governor.

Time	Volts at Lamp	Amperes	Notes
8:00 AM	6.0	5.7	
10:00	6.0	5.6	
11:00	6.0	5.7	
12:00	6.0	5.6	
1:30 PM	6.1		
2:00	- 5.0		

4.8 hours
4.5 - 4.8
9.3 Total

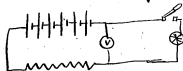
Mr. Hitchison, Mr. Gall, Mr. Wilson and others saw the pictures in the committee room.

50 C.P. -- 6 Volt 10.5 amp lamp.
gave a yellow light and was not
as good as the 30 C.P. 6-V-5.7 amp.

#2909

Friday April 18 '13

Home Kinetoscope was set up in the Committee room. Incandescent lamp connected to 6-46 storage cells in series with an adjustable resistance.



Voltage was adjusted to 6.5 Volts:

^{#E} 30 C.P. lamp, silvered $\frac{1}{2}$ vertically was tried first.

^{#F} A 30 C.P. lamp, plain bulb was next

^{#G} 50 C.P. lamp, plain bulb, last.

Plain bulbs gave better results than bulbs silvered $\frac{1}{2}$ vertically.

50 C.P. was better than the 30 C.P. but 50 C.P. had a little color rim because large bulb kept filament away

#2909

Fri. April 18, 13

from condenser, the light spot not quite covering the picture.

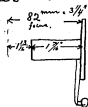
C^E G^E De Phonographes
Cinematographes

Appareils De Precision

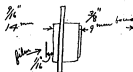
8th Arr^{and} au Capital de F^{ran}cs 15,000,000
98 Rue de Richelieu - Paris.

Brevete' S. C. D. C.

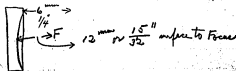
Objective



Condenser



Mirror

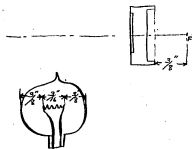


Extra White Aluminium G.H.

German-American
Bronze Powder Mfg Co
80 Warren St NY.

#2909

Fri. April 18, '13.



22909

Sat. April 13, 1913.

Mr Hutchison has returned from Washington.

I told him of the results from a plain bulb compared with that from a silvered bulb. He was too busy to see the pictures but he told me to take a machine and equipment to the G. E. Co. in order to have photometric tests made.

Measurements taken of the lens system and reflector on the French home machine together with a few calculations revealed the interesting fact that although this machine used a spherical reflector, the lamp was placed in a position such that the image was superimposed upon its filament, exactly the same principle we are using in silvered bulbs. ~~the lamp was placed~~

2909

Mon April 21, 13

Took the 8 o'clock train for Newark
and trolley to Harrison.

Mr. Porter had a committee meeting
in the morning. Mr. Muller showed me
through the lamp works and the lamp
tests were made in the afternoon.

Mr. L. C. Porter, Mr. Sommers
and conducted the photometric tests
and finished at 5 P.M. *me*

#2909

Tues. April 22, 13.

Mr. Gall saw me Saturday about making experiments with aluminium screens for the Home P.K. A corrugated cloth is to be tried in order to increase the angle of view.

Mr. Edison wants Gall to try a spherical reflector with the arc light in large Kinetoscopes. Quartz is suggested as the best material.

An aperture $\frac{1}{8}$ " dia is placed in front of the arc in the Home P.K. I want to try this experiment in order to see if the picture is sharper — this was found to be the case when an aperture was used before the Nernst Lamps.

#2907

Wed. April 23, 13.

H.T.K. Screens - Corrugated cloth.

Aluminium carriers:

- 1) Water Proof Glue (Jamison)
Amyl Acetate for thinning.
- 2) Barium Sulphate & Gelatine
Grind to fine powder
Add a little Chrom alum just before use.
- 3) White glue & water.
4. Zinc white, white glue & water
5. White lead, turpentine
apply with brush.
Polish with silicate of magnesia.

SP-2 #2909

Thurs. Apr. 24, 13

30 C.P. Concentrated helix

6.0 Volts - 5.5 amperes,
6.5 " 5.7 "

50 C.P. concentrated helix

6.0 Volts. 10.7 amperes.
6.5 Volts. 11.2 amperes.

Aperture $\frac{3}{8}$ " dia. front of arc light
in H. P. K. did not improve the
pictures. Two machines were tested
side by side.

My aluminium covered screen
with vertical corrugations has a
wide "angle" but its illumination in
front can be improved. The aluminium
coating is a little thin because day light
can diffuse through it in places.

~~207~~ 209

Fri. April 25, 13.

A representative of the Army was here today in order to study the Home P.K. Halpin and I gave an exhibition with both the incandescent lamp and the arc light in Ramsay's room.

Afterwards, we went to the film plant in order to show some large films.

Saturday.

at Westerly R.I.

#2909

Mon. 28, 13

Mr. Hutchison wanted a new 30CP lamp Sunday but could not find it. He advised me to order 2 doz new lamps, using heavier copper heads and larger bulbs.

I talked with Mr. Bettcher and he said he would use a heavier head and 9 25 bulbs. He requested that I send him the lamps which have failed. 3 lamps and a letter was sent this afternoon.

Mr. Hutchison called the Cutler-Hammer Transformer people on the telephone, and their representative came up late in the afternoon.

I started to put aluminium powder on screen painted with Varnish.

#2909

Tues. April 29, '13.

~~Revised~~ Varnished the corrugated aluminium screen. While the varnish was still sticky, aluminium powder was sprinkled upon it and then it was gone over with a felt covered roller.

This screen gave very good results at a trial in the committee room.

Mr. Marshall, production clerk, has made the aluminium screens.

#2909

Wed. April 30, '13.

Lamps tested at G. E. Works:

Lamp #1.

30 c.p. Plain bulb.

Filament good shape - bulb clear.

H. & - intact.

Lamp #2

30 c.p. Silvered.

Filament shape OK but not central.
Image displaced $\frac{1}{2}$ dia of helix to the right.

H. & - on one lead broken.

Lamp #3.

50 c.p. plain bulb.

Filament helix is tipped about 15°
with both the vertical and horizontal
axis. Bulb clear - H. & broken off
both leads.

Lamp #4

50 c.p. silvered bulb.

Image of filament is directly above
the filament helix.

Filament is a better helix than the
filament of lamp #3.

H. & broken from both leads.

#2909

Wed. April 30, '13.

Most of today was spent on writing reports and calculations.

Mr. Hutchison requested me to find what a Sharpe-Miller Photometer costs. I called up the Newark ~~for~~ Electrical Supply Co and they promised to look it up.

Mr. Elson approve the order of a Sharpe-Miller Photometer - May 9, '13.

#2909

Thurs. May 1, '13.

Back Focus
measured to lens surface.

A Motion Picture

A Stereoptican

B Motion Picture

B Stereoptican

C Motion Picture

C Stereoptican



A Condenser



41° 40'

B Condenser



51° - 0

C Condenser



65° 10'

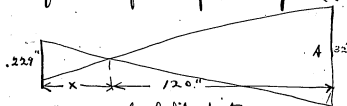
Mr. Gall saw the corrugated screen today. He thought it good and advised me to experiment with different materials for the screen.

I ordered 1 pound of aluminum powder. Received same from Rio May 6, '13.

#2909

Fri. May 2, 13.

Equivalent focus of ABC objective:



.229" is length of film picture

 $\frac{A}{x}$ is length of projected picture. x is focal length of objective

$\frac{.229}{A} =$	$\frac{32}{120}$	for C objective
$A =$	24	" B "
$A =$	16	" A "

.229 : x :: 32 : 120 for C $x = .859$.229 : x :: 24 : 120 for B $x = 1.145$.229 : x :: 16 : 120 for A $x = 1.718$

Stereoscopic lenses are 3 times the focus of the motion picture objective.

#2709

Fri. May 2, '13.

"Angle" of 3 objective lens.

$$\tan C = \frac{16}{120} = .1333 \quad \angle \text{angle } C = 15^{\circ} - 12'$$

$$\tan B = \frac{12}{120} = .1000 \quad \angle \text{angle } B = 11^{\circ} - 26'$$

$$\tan A = \frac{8}{120} = .0666 \quad \angle \text{angle } A = 7^{\circ} - 38'$$

#2909

Sat. May 4, 13.

This morning was spent upon the design of a reflector and a suitable mounting to support the reflector and incandescent lamps.

The necessary specifications for such a mounting with the required adjustments is covered by the type written notes.

#2909

Mon. May 5, 13.

Spent the afternoon in N.Y.C. ⁱⁿ
Unable to find a spherical mirror.

Places which I visited.

Bausch & Lomb Optical Co.
200 - 5th Av. N.Y.C.

E. B. Maymont
125 W 42d Street.

E. B. Maymont
237 5th Ave.

E. B. Maymont
170 Bway.

Herbert & Huesgen
311 Madison Ave.

The only reflectors they carried
were parts of instruments.

#2909

Mon. May 5, 13.

Experiments with lens systems.

Using C objective.

I try C. condensers

II. " B "

III. " A "

Since A condenser has a smaller angle and the source of light is further from condenser, this combination should give a picture which is not illuminated as well as the picture in test I.

A small difference could be detected with the eye, but a photometer should be used in order to get complete and definite data.

May 6, 1913

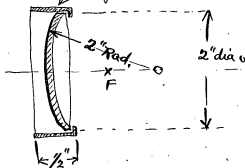
1055 #2909

Tues. May 6, 13

Ordered this morning from
Bausch & Lomb Optical Co.
Rochester, N.Y.

One (1) Spherical Mirror Reflector.

Curvature 2" radius (having a
focus of 1")
Aperture 60° or 2" dia opening.
metal jacket



These mount glass reflector in
a cylindrical metal jacket. This
will have a sliding fit in a sleeve
which we shall make.

PLEASE RUSH.

[105]

#2909

Tues. May 6, 13.

Called Mr. Bettchmer at
G. E. Harrison 2, 82
He promised to push the order
as rapidly as possible.

#3363

~~2209~~

Tues. May 6, 13

Received today from Mr. Holland.

One Western Electric Company 228 W
Transmitter.

One receiver -

power current .14 to .3 amperes!

3363

Wed. May 7, 13.

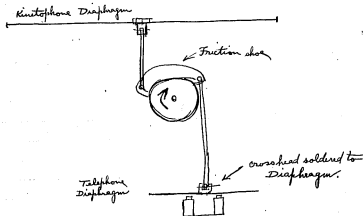
Webb. Microphone Philadelphia
used with Phonograph Records.
Mr. Gall says this is good.

Fractional Microphone for
Train Dispatching.
Lab. S.O. #3363 per J.G.M.

Received from Mr. Holland. one
Am. Bell Tel. Co Induction coil.

#3363

Wed. May 7, 13.



A thinner cap for the telephone receiver is being made because the hard rubber one is too bulky to fit in the limited space on the Kinetophone apparatus.

A crosshead was soldered to the receiver diaphragm. At the least minute just for a very preliminary test, the receiver (diaphragm) connected by the link to friction shoe was held in the hand while another fellow spoke into the transmitter. Promising

3363

Thurs. May 8, 13.

Finished the aluminum cap for
telephone receiver and the mounting
to support the receiver is well along.

Visit to G. E. Lamp Works.

Mr. L. C. Porter
Illuminating Engineering.

Mr. Bunnell
Automobile Sales Dept.

Mr. Jackson
Ch. Eng. Experimental Dept.

Mr. Bettcher
Engineering Dept.

Mr. Mc Cracken
Order Dept.

Mr. Rogers for Process Illuminating.

#3363

Thurs

Fr. May 8, 19.

Mr. Porter recommended the
~~Foot-Pearson~~ Sharpe-Millar
Photometer as the only photometer
to be considered seriously.

The Foot-Pearson Co.

160 Duane St. N.Y.C.

Tel. Worth 1-520

carry this instrument in stock
Cost \$ 125⁰⁰.

The Western Electric Company
also advises that O.T. Louns
70 - 5th av. N.Y.C.
handle the entire line of
scientific instruments.

Mr. Porter says that our 30 C.P.
6V 6A are called Concentric
Helip. — not Concentrated Helip.

3363

Thurs. May 8, 13

Mr. Jackson Ch. Engr of
Experimental Dept. promises
a new 110 volt incandescent
lamp of high concentration very
soon.

A very efficient lamp

Concentration within a cylinder
 $\frac{5}{16}$ " dia and $\frac{5}{16}$ " length.

1000 hours life

250 Candle Power.

He expects to bring over 50
complete lamps soon.

3363

Fri. May 9, 13.

I saw Mr. Hutchison this morning in regard to incandescent lamps, receptacles, and also about the Train Dispatcher experiments.

Mr. Hutchison had a talk over the telephone with Mr. Jackson. Mr. Hutchison wants a 40 or 50 volt lamp immediately. He also requested that we have one of the 110 volt lamps in order to test it in the Home P.K.

Mr. Hutchison dictated a long and comprehensive letter to Mr. Burnham, head of G. E. Lamp works, in regard to our urgent need of incandescent lamps for large commercial and also Home P.K. motion picture machines.

E 3363.

Fri. May 9, 13.

Test of Frictional Microphone
for Train Dispatching:

With one tray of storage cells (6)
about 7 volts — without induction coil:
Words from horn lack volume.

Induction coil was added but
with little improvement

Another tray of 6 cells was
added in series with the first tray:

A little increase of volume was
obtained but the results were not very
promising.

#3363

Sat. May 10, 13.

Mr. Holland invited me to hear his loud speaking receiver which he has set up in the Electrical Dept. This outfit does not use the induction coil but it is fairly loud and distinct.

Mr. Holland and Mr. Hutchison listened to my microphone while spoke into the transmitter. Transmitter was on Mr. House's desk and the microphone was out in the hall.

Mr. Holland promised to make a special transmitter and receiver about Tuesday.

#2909

Mon. May 14/13.

Wrote notes on use of Sharpe-Millar
Photometer.

Connected up the transformer
to 6 V. 30 C.P. lamps.

The primary is designed for
110 V but our line voltage is
over 120.

I borrowed an A.C. Voltmeter,
120 Volt scale, from Hutch's office,
but voltmeter is not large enough.
Put add Home P.K. Resistance coil
in series and the voltage dropped
to 85 Volts.

Mr. Gall called Farrel of the
Keritophone left on the telephone
order to borrow a 220 AC
voltmeter.

St #2909

Tues. May 13, 13

Mr. Marshall who has made aluminum screens came up this morning. I wanted to get the sizes of screens made and the width of rolls used.

27 x 36" screen

58" roll.

40 1/2 x 54

60" roll

54 x 72

60" roll.

Marshall says he has about
300 screens in stock.

#2909

Tues. May 13, 13.

Tested the Cutler-Hammer
transformer 110 volt primary
and 6 volt secondary.

Line voltage 110 - 60 cycle.

When the primary is connected
to the line, the 25 ampere
fuses blow.

A second transformer was
used in series with the circuit
and the voltage was thereby
reduced to 38 volts. Even at
this voltage at the primary the
small transformer became dangerously
hot in a few seconds.

Mr. Gall told me to call Mr.
Slater, Cutler-Hammer - 607 Third St
50 Church St N.Y.C.

Mr. Slater was not there but
Mr. Montgomery promised to have
Mr. Slater see Mr. Gall.

3363.

Wed. May 14, 13.

Material for Home P.K. Aluminum Screens:

The following size screens have been made and about 300 are now in stock:

Size Screen	Width Roll
27"x36"	58"
40½"x54"	60"
54"x72"	60"

14 different manufacturers of cloth or imitation leather were requested by letter to submit prices and samples of their goods which had a vertical rib or corrugation similar to an enclosed sample from us.

None of the manufacturers who replied could furnish material in rolls 60" wide but many could supply us with widths up to 54".

A few samples of Aluminum screens were submitted as follows:

3363

Wed. May 14, 13.

54 1/2" aluminum	60¢ per running yd.
40" "	33¢ " "
38" rifle white	16 1/2¢ " "

Mr. Gall has a new B condensers from Bausch & Lomb. This is a special lens made from better glass. Mr. Gall wants me to test this lens and to compare it with the old B. condensers.

Telfaire gave me the loudtalking transmitter and receiver this afternoon.

As first set up - western transmitter with loud sounding receiver, a rattling sound was heard. This was due to the grating of particles in the carbon transmitter. A special transmitter did not have this sound but the sounds lacked volume.

#3363.

Thurs. May 15, '13.

Sent in weekly report.

A new transmitter was tested this morning. The first tests were failures because the receiver was not properly polarized with the line and the receiver became demagnetized. After the receiver was remagnetized, it was again tested but the sounds lacked volume.

Mr. Holland decided to try another transmitter because this apparatus seems to be a problem in receivers and transmitters. After the proper transmitter and receiver are found the matter of a good friction device is easy.

Mr. Hutchison sent up Mr. Jackson's letter in regard to 110 volt experimental lamps and I got busy making to fit up two machines one with the 6 volt lamp and the other with the 110 volt lamp.

Thursday May 15

Since the condenser lens is only $3\frac{1}{2}$ inches above the lamp-base floor, and since the new 110 volt lamp is $4\frac{1}{2}$ inches from base to filament, it was necessary to cut a hole through the lamp base floor and also through the sliding board. This was sufficient to bring the filament at the center of the condenser and also enough to allow a slight vertical adjustment.

The hole is not large enough to allow horizontal adjustment for A and B system lenses but this hole can be enlarged later.

Mr. Hutchison advised me by memo that a representative from the G. E. Company would call tomorrow with the Sharpe-Miller Photometer.

#5909

Fri. May 16, 13.

I connected up the two Home machines in the show room, third floor back, laboratory.

An adjustable rheostat was put ~~into the~~ in series with the line in order to reduce the voltage from 125 to 110 which is normal voltage for the new lamps.

Mrs Jackson was present at our tests and he remained until noon.

A C system lens system was used and the picture was projected upon the ordinary porous "talking picture screens." ~~But~~ "Smearing off smoking" was the film, which has some very dark scenes in it, especially where the victim leaves the dining room after he is tortured by the night & smell of his friends' cool, frequent, after luncheon cigar.

This scene was showed to

#5909

Fri. May 16, 13

Mr. Edison, both ~~from~~ the machine using the 6 volt lamp and again ~~from~~ the machine using the 110 volt lamps.

The machine was then carried to the back of the room until a very large picture was thrown upon the screen, using the C system lenses.

Mr. Edison was greatly pleased with the results and he said give the business to the G. E. Co. And then ^{when} would have to buy his storage batteries.

Mr. Edison was particularly pleased because of the prospects of doing away with the arc light.

#2909.

Fri. May 16, 13

Mr. Summers of G. E. Co.,
Illuminating Engineering Dept., called
with his Shufeldt Miller Photometer.
He explained the method of using this
instrument and gave me the
proper constants. For accurate
results, the instrument should be
frequently calibrated. New standard
lamps can be ordered through the G. E. Co.
and of course, the photometer must
be recalibrated whenever a change of
standard lamps is made.

Constants:

242 Mils. lamps should be
put through the standard lamp by
means of a few batteries.

Elbow Side

Dark screen - divide reading by .038
Light screen - " " " .214

Standard Side

Dark screen - multiply reading by .038
Light screen - " " " .214

Sat. May 17, 13.

Mr. Holland is working on a new transmitter. The last one had good volume but the sounds had a very pronounced "horn effect". The new transmitter which Mr. Holland hopes to correct the above defect, will be ready Monday.

Set up the Sharpe Millar Photometer
winder to try it out.

#2809

Mon May 19, 13

Test of New B" Condenser
from Banach and Lomb.

Picture 27" x 36"

Photometer at center of picture

Commercial B condensers

1	3.3
2	3.2
3	3.0
4	3.2
5	3.0
6	3.2

189 average 3.15

Dark screen on standard side

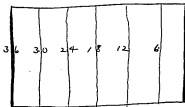
Special B condensers,

1	3.2
2	3.2
3	3.1
4	3.1
5	3.2
6	3.2

6 | 19.0
3.16

2909

Mon. May 19'13

Special Co.
Barrick & Sons

Screen section 0

Photometer screen Dark standard side

- | | |
|---|-----|
| 1 | 3.8 |
| 2 | 3.8 |
| 3 | 3.8 |
| 4 | 3.9 |
| 5 | 3.9 |
| 6 | 3.8 |

$$\begin{array}{r} 6243.0 \\ 3.83 \end{array} \times 0.38 = .146 \text{ ft. cd.}$$

Screen section 6

Photo screen: Dark standard side

- | | | |
|---|-----|-----|
| 1 | 4.4 | 3.7 |
| 2 | 4.2 | 3.6 |
| 3 | 4.3 | 3.7 |
| 4 | 4.4 | 3.6 |
| 5 | 4.0 | 3.8 |
| 6 | 4.3 | 3.8 |

$$\begin{array}{r} 6222 \\ 3.70 \end{array} \times 0.38 = .141 \text{ ft. cd. (15)}$$

2909 8

Mon. May 19, 13

Screen Section 12

Photo. Screen Dark Standard Size

1 3.8

2 3.8

3 3.7

4 3.9

5 3.9

6 3.9

23.0
3.83

$\times 0.38 = .146$ Ft. Cd.

Screen Section 18

Photo. Screen Dark - Standard Size

1 3.8

2 3.8

3 3.7

4 4.0

5 4.0

6 4.0

23.3
3.88

$\times 0.38 = .147$ Ft. Cd.

2909

Monday May 19, 13

Screen section 29

Photo screen Dark Standard Side

- 1 4.0
- 2 3.6
- 3 3.6
- 4 3.6
- 5 3.5
- 6 3.6

$$\frac{6 \times 2.19}{3.65} \times .880 = .139 \text{ F.C.D.}$$

Screen section 30

Photo screen Dark Standard

- 1 3.6
- 2 3.6
- 3 3.7
- 4 3.5
- 5 3.6
- 6 3.7

$$\frac{6 \times 2.17}{3.63} \times .880 = .158 \text{ F.C.D.}$$

#2909

Mon May 19, 13.

Screen Section 36

Photo Screen Dark Standard.

1 3.7

2 3.5

3 3.6

4 3.6

5 3.6

6 3.5

$$\frac{21.5}{3.58} \times .036 = .136 \text{ Fed.}$$

2909

Mon. May 19, 13.

Stock B. Condenser

Screen section. 0

Photo screen Dark standard

1	3.5
2	3.3
3	3.3
4	3.2
5	3.3
6	3.3

$$\frac{6 \times 3.3}{3.78} \times 0.050 = .132 \text{ Ft. Cd.}$$

Screen section 6

Photo screen Dark standard

1	3.5
2	3.5
3	3.5
4	3.6
5	3.5
6	3.5

$$\frac{6 \times 3.5}{3.51} \times 0.050 = .133 \text{ Ft. Cd.}$$

#2909

Mon. May 19, 13.

Screen Section 12

Photo Screen Dark Standard

- 1 3.5
- 2 3.4
- 3 3.5
- 4 3.4
- 5 3.5
- 6 3.4

$$\frac{6 \times 20.7}{3.45} \times .035 = .131 \text{ Ft. Cd.}$$

Screen Section 18

Photo Screen Dark Standard

- 1 3.3
- 2 3.4
- 3 3.4
- 4 3.3
- 5 3.4
- 6 3.4

$$\frac{6 \times 20.2}{3.37} \times .038 = .128 \text{ Ft. Cd.}$$

#2909

Mon. May 19, 13.

Screen Section 24

Photo screen dark standard

1 3.4

2 3.4

3 3.3

4 3.4

5 3.3

6 3.4

$$\frac{20.2}{3.37} \times 0.08 = .128 \text{ Ft. Cd.}$$

Screen Section 30

Photo screen dark standard

1 3.5

2 3.3

3 3.3

4 3.4

5 3.4

6 3.3

$$\frac{20.2}{3.37} \times 0.08 = .128 \text{ Ft. Cd.}$$

2909

Mon. May 19, 13

Screen Section 36

Photo screen

Dark standard

1	3.3
2	3.2
3	3.1
4	3.1
5	3.1
6	3.2

$$\frac{619.6}{3.17} \times 0.36 = .120 \text{ Ft ed.}$$

Two machines equipped with arc lamps
 were set up side by side in the committee
 room and the pictures thrown ^{on the wall} upon the screen
 were of equal size, and kept in sync.

2901

Mon. May 19, 13.

Test for Rudolf.

Large machine

see blown with magnet A.C.

Intensity of light reflected from screen
white cardboard - unglazed

30" x 40"

54" distant from screen.

Photo screen

With magnet,

Am.

1	7.6	45
2	5.0	50
3	5.2	47
4	5.0	46
5	5.2	48
6	5.4	50
7	5.0	50

$$\begin{array}{r} 7 \overline{) 35.4} \\ 5.06 \end{array}$$

ft candle.

$$\begin{array}{r} 6 \overline{) 28.6} \\ 47.7 \end{array}$$

155
5024

Aug 20

$$\frac{2.39}{1.94} \times 100 = 23.2\% \text{ gain in illumination with reflector}$$

2901

~~2900~~

Test for Rudolf Tues May 20.
45 ampere.
Photo screen 0.

With spherical
Reflector

2.1
2.1
2.4
2.6
2.6
2.4
2.5

267
2.39

Without.
Reflector

1.5
1.6
2.1
2.1
2.2
2.1
2.0

craters in front for above readings
carbon file has order to bring craters
in back.

1.7
2.1
2.0
1.9
2.0
59.7
1.94

1.0
1.45
1.8
1.7
1.85
57.80
1.56

$$\frac{1.94}{1.56} \times 100 = 24.3\%$$

increase illumination
with reflector.

969

2909

Tues. May 20, 13.

Connected up ~~the~~ two Home P.K. machines, one with 30 C.P. 6 volt 6 amp lamp and the other with 110 volt incandescent lamp.

6 volt lamp.	27" x 36" picture
110 volt lamp	54" x 72" aluminum
110 volt lamp	10 ft. regular picture screen.

Mr. Graft, of the foreign representative was pleased with the results.

Submitted report on new "B" condenser made by Bauach, C. Lomb.

Ordered necessary parts and started to assemble;

1. Home P.K. 6 V 6 amp incandescent lamp
2. " " 110 V 3 " 370 C.P. "
3. " " Baby arc.
4. " " Special arc lamp house

4.70

Average Et-Candles with Magnette blower

516 Et-Candles 47.7 amp.

Plain are.

4.70 Et-Candles 48.6 amp.

.36

$\frac{.36 \times 100}{4.70} = 7.66\%$ increase with blower

2901

Test for Radolf.

Plum are in Kintomafu.

Photo 0.2000 Am

1	4.5	48
2	4.8	52
3	4.7	48
4	4.6	48
5	4.9	49

5123.5 pounds. 5124.3

Inspected 6 "B" condensers taken at random from an order of 200. These were compared with the sample submitted. The 6 Bld. "B" condensers were all as good as sample. See report May 21, 13.

I made a complete report to Mr. Hatch on the experiments with Frictional Microphone for Train Dispatching. May 21, 13

all in all

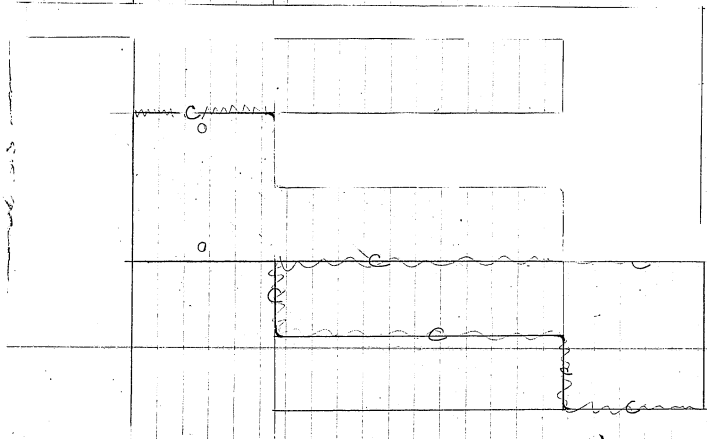
Thurs. May 22, 13.

See New Books No 2.

[ITEM(S) FOUND IN BOOK]

Interlocking blanket

$8\frac{5}{8}$ width of metal strip.



**Notebook Series -- Notebooks by Experimenters Other Than Edison
Kinetophone and Kinetoscope Experiments -- L. E. Briggs Books
Notebook, N-13-09-17**

This notebook was used by Leroy E. Briggs during September 1913-January 1914 for experimental notes on an automatic film developing machine. The book consists primarily of a daily account of Briggs's activities, including experiments with new or improved parts made for the machine. There are occasional references to work on the home projecting kinetoscope and to the "other book" (N-13-05-22 [not selected]). The notes indicate that Briggs's work on the developing machine was overseen by Edison and Miller Reese Hutchison. There are occasional notations regarding Edison's opinions or suggestions. The notes also indicate that William W. Dinwiddie, Absalom M. Kennedy, Charles W. Luhr and James W. Ramsay were involved in similar work. The front cover is labeled "Automatic Machine for Developing, Fixing and Drying Motion Picture Film. L.E. Briggs SO. 3300." The pages are irregularly numbered. Approximately 75 pages have been used.

56700
Acme Co.,

MFG. STATIONERS,
96 JOHN ST.
AND
19 PLATT ST.
NEW YORK.

L. E. Briggs
Thomas A. Edison
Laboratory, Orange, N.J.

Motion Picture Film
Developing Machine

S.O. #3300.

3300

Wed. Sept 17, 13-1

Afternoon.

Cleaned out the developing room.

Developing trays have been held up by wooden wedges. Hooks or something more permanent should be used.

Ordered the flower which is to replace the one Skinnidie took away.

Mr. Luber is making new sprockets of Monel metal:
12 Monel metal
24 brass to be nickelled

Rosenberg says he found 4 ft.
shrinkage in 400 ft of film run through
developing machine.

This is not confirmed by my
experiments.

2300

Thurs. Sept 18, 13²

Washed the reservoir for
developer, hypos, and glycerine
and got 13 rubber corks
for same.

Washed glass funnels and
glass supply wells.

Ordered 3 pieces of $\frac{1}{4}$ glass
tubing - each 60" long. These
are to lead the developer etc
from reservoir to ~~tanks~~ trays.

Made wood brackets to
hold the bucket carriers
and also moved metal
trips for buckets.

Experimented with bucket
trips.

3300

Fri. Sept 19, 13.

Put up 3 wood brackets,
set moved metal trips in
proper positions and connected
up cords. Adjusted brackets.

Connected glass reservoirs
with glass wells by
means of glass by-cocks
and rubber tubing.

The small spray nozzles
on the washer are stoppered up
and the washer as a whole
is too crowded. The water
splashes over the steel driving
chains and on the floor.

Ordered 6 ft of $\frac{1}{4}$ " rubber tubing
and 3 red incandescent lamps.

Started to alter the washer.

3300

Sat. Sept. 20, '13

I saw Linviddle this
morning and I bought down
the cooling tanks for
developer-tank circulating water.
Also a kerosene-mercury
thermostat.

3300

Monday Sept 22, 13

4 1/2

Got monel-metal catalogues from Simpson.

ordered 2 sheets of monel metal $32 \frac{1}{2} \times 96$ ".021" thick and 1 gross of No. 2 56 threads per inch of monel metal.

Pat Brady telephoned to Biddle Hardware Co but they could not supply us with the monel metal screws and we had to take two sheets

32×96 ".021" thick which are promised in 3 days.

Mr. Luhr ordered 72 steel collars and 72 small set screws to be nickel plated at the Works.

I made a sketch of water jacket and another of washer trays. Gave these to Mr. Luhr.

3300

Mon. Sept. 22, 13.

#2

Put up the new Sirocco
Fan - Am. Blower Co.

Fan No 6297A.

Westinghouse Elec & Mfg Co.

Pittsburg, Pa. U. S. A.

Direct Current Motor Shunt Wound.

$\frac{1}{16}$ H.P. 110 volt.

.72 amp. 1600 R.P.M.

Style No. 50 466754

Serial No. 994401

This blower is used to
circulate the air in the room.

The blower on the ~~bl~~
drying tower overheats.

Type P.R. volts 110

Amps 2

Size

Rev. 3400

No. 6537

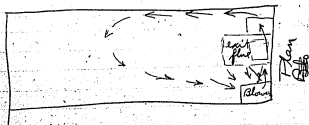
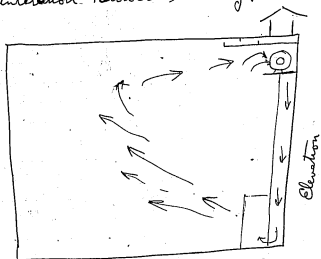
B. F. Sturtevant Co
Boston Mass.

4 1/2

3300

Mon. Sept. 22, 13

Traced air currents in the
room by means of smoke.
Ventilation Blower running.



3300

Tues. Sept. 23, 13

8:30 AM Room Temperature 62°

9:00 64°

9:30 Blower for slayer tower is too hot to run.

I took off this blower and turned over to Mr. Kennedy to have repaired.

I find that all chain sprockets are loose on the shafts. The set screws are too small to hold. All these must be drilled out for a larger set screw.

I have decided to put the chains back of the hanger planks and thereby keep them dry and away from water.

Took down the supporting wood beams for sprocket shafts etc. Had Mr. Mudd saw places to allow chain to run on back side.

3300

Tues. Sept. 23, 13

5/2

Told Mr. Madd how I wanted a filter box between window and the ventilation blower.

Had Mr. Lohr make the pipe connection between the blower flange and the filter box. This connection is of sheet metal and it has six slots on its circumference. These slots or air-ports permit air from the room to be drawn in by the fan when the weather is very cold.

Got brass wood screws to replace iron which were rusting in bronze castings. Got small brass set screws also to replace iron ones.

Got a rod of drill-rod for new driving shafts which are about 1" longer than old ones.

3300

Wed. Sept 24, 13

6 1/2

Changed the electric lighting circuits for ruby-lights, white room lights, blower, etc. under that each may be turned on or off independent of each other.

Got the slotted pipe connection ~~from~~ between the ventilation blower and the filter-box. Helped the carpenter to put it on, and I instructed the carpenter how to make filter box.

Kennedy's man cleaned up the blower for ^{the} drying tower but it still heats up. I had him drill some 1/2 holes in the motor case as an aid to ventilation but the motor continues to heat.

3300

Night - 7:30 - 12:30.

Wed. Sept. 24, 13

Got the chain-sprockets from Mr. Duke, and also necessary screws that I would need.

Cut drillrod into correct lengths for shafts. Spotted positions of set screws on shafts and filed flat spots for same.

Connected and set up shafts, sprockets and chains on lower hanger in ~~the~~ Film drying Tower.

Same for longer for Washers. Chains now run outside of washers and are no longer exposed to water.

3350

Thurs. Sept. 25, 13

7½

Gave the blower of the Film
drying Tower to Mr. Luker under
to have him pipe some air from
fan chamber through the motor case
for cooling purposes. He found
one bearing in bad condition.
I tested the armature for grounds
but it didn't have any.

Got Eastmans regular formula
of developer from Mr. Ward.
Developer. #16

Sodium Sulphite	3 lbs 5 oz
" Carbonate	1 " 9 "
Metal	1 80 grains.
Hydroquinone	8 oz
Bromide Potash	1 2 63 grains
Citric Acid	4 00 grains
Potash Metabiph	2 oz
Agua	10 gal.
65 %	

132.5 grains
= 1 oz.

3300

Thurs. Sept 25, 13.

Got 8 more chain sprockets
from Mr. Luhn.

Ordered Perfection Paper
fastener for connecting pieces of
film. Charged to #2888.

Connected up the sprockets
chain and sheets on hangers
for developer and hypo trays.

The chain at the hypo
tray was so rusted that it
could not run around the
small sprockets. Soaked it in
kerosene oil.

Thurs. Night.

Tried small film feeding motor
and let it run until 10 PM.
Chain was connected as far
as the washer.

Attended electric wiring in
room.

3300

8/2
Fri. Sept 26, 13

Cleaned and oiled chains.
Connected up all shafts with
chains.

Threaded the machine with film
and started to change old sprocket
rolls for new sprocket rolls.

Fixed electric light receptacles
to hold ruby lights with shades.

Gave Mr. Lyman some bottles
to hold developer which he will
mix.

Received the paper fastener which
is used to join pieces of film.

Mored metal came in today
but Mr. Link says he can not
make cooling jacket for several days.

3300

Set 27, 13

Tried blower which Mr. Luhn
fixed for me. It runs very
good now.

Made some gages to
assist in locating the sprocket
rolls for film.

3300

Mon. Sept. 29, 13

Put on all sprocket-rolls and lined them up in order to make the film run freely.

These rolls and the driving chains work well.

Started to put tower blower in position but had to return it to Lube because the machinist had not put it together as it was originally.

Started to set up the cooling water reservoir. Gave it to a tinmith to have position of overflow changed.

Tindmith is making my washer tray and is putting a water jacket on the developing tray.

3300

Tues. Sept 30, 1913

Put up blower for Film
drying Tower. It runs very
good now.

Fixed pipe connections for water
supply. One valve supplies sprayer
to run off ~~and~~ developer. Another
valve is for general supply to
cooling water reservoir etc.

Gave Mr. Mudd a sketch for
a stand to support the cooling
water jacket ~~off~~ Put cooling water
reservoir in position on this stand.
Connected up small water to run
the circulating pump which maintains
a constant difference of head in
the reservoir.

Experimented with the Xerosene
-oil. Mercury Thermostat in order that
I could adjust the light of mercury
at center of tube for 65°.

Put up a new tray etc. on the
washer.

3300

Wed, ~~Sat~~ Oct 1, 1913

12.

Most of today was spent in making the electrically operated valve which permits ice water to run into the cooling water reservoir when its temperature becomes over 65° . The electric circuit is made in the kerosene-oil-mercury thermostat.

Got the developing tray with its new cooling water jacket.

3300

Thurs. Oct 2, 13.

Put up drain troughs, traps
stoppers tubing etc and tried
out

Will try to get desired
temperature regulation tomorrow.

F 4.5

F 6.3

F 9.

F 12

F 18

F 25

This film was then left
out in my dark room for 15 min
all red lights on. When developed
the film was fogged showing
that the room is too light.

3300

14
Fri. Oct. 3, 1913

Calibrated the solution
reservoirs and wells.

Painted the Washer Chamber.

Experimented with cooling
water apparatus. Had to
elevate large tank in order
to increase hydrostatic head.
Developer tray had to be taken
down and repaired twice because
of leaks.

Had a cover made for small
ice-box.

3300

15
Set. Oct. 4, 1913

Got a M.P. Camera, film,
telescope, tripod etc.

Set up in yard and made
a test exposure.

F 4.5

F 6.3

F 9

F 12

F 18

F 25

This film was then
left out in my dark room for
15 minutes - all red lights on.
When developed, the film was
fogged showing that the room
is too light. (test film was
developed at small Film Plant).

201

3300

Mon. Oct 6, 1913

Finished alteration on the Washers chamber. All the sheet metal work is now finished.

Data and Results of a preliminary test of machine — reservoirs, walls, and trays were filled with water instead of their respective solutions.

Time 3 PM Mon. Oct 6, 13

Outside temperature 74°F

Room temperature 76°F

Air temp of cooling water 55°F

" " developer in tray 70°F

{ water temp - devel. temp.

55° 70°

55° 70°

55° 70°

55° 70°

By passing the ventilation air supply over a block of ice the room temperature ~~was~~ gradually became constant at 74°F.

3300

Morris Oct 6, 13.

Time interval required for the
film to travel 6 ft.

Test:		
1st	5 min	58.8 sec
2	5	55.8
3	5	53.8
4	5	51.5
5	5	50.0
6	5	47.0
7	5	51.4
8	5	50.2
Total 8	40 min	418.5 sec
Average	5 min	52.3 sec.

$$5 \text{ min } 52.3 \text{ sec} = 5.87 \text{ minutes}$$

$$\frac{6 \text{ ft}}{5.87 \text{ min}} = 1.022 \text{ ft per min.}$$

$$\text{or } 61.32 \text{ ft per hr}$$

$$\text{or } 1472 \text{ ft per 24 hrs.}$$

88 3300

Mon. Oct ⁶~~7~~, 13.

Rate of developer supply:-

300 cc. devel. in well at start
2500 cc " " reservoir " "

After 35 minutes 16 seconds in operation.

250 cc devel in well at finish
1800 cc " " reservoir " "

38 buckets during this interval.

750 cc

$$\frac{750}{38} = 19.74 \text{ cc per bucket.}$$
$$\frac{38}{35.27} = 1.077 \text{ bucket per minute}$$
$$\frac{750}{35.27} = 21.264 \text{ cc per minute}$$

or 1276 cc per hr.

or 0.337 gallons per hr

or 5.497 gallons per 1000 ft.

480 grains per ounce
 16 oz per lb
 Avordupois weight

437.5 grains = 1 ounce
 16 oz or 7000 grains = 1 pound.

4 quarts = 231 cu. in. = 1 gallon U.S.
 1 gallon U.S. = 3.78544 liters
 1 liter = .2642 gallons U.S.

1 gallon water at 62°F. weighs 8.3356 lb.
 " " " " " " " " 133.4 oz.

one fluid ounce is $\frac{1}{128}$ part of 1 U.S. gallon
 128 fluid ounces = 1 gallon U.S.

33.00

	Price	Mon.	Oct. 6
Castor oil #16	5 lb. per 25		Cost per 10 gal solution
3 lb. 5 oz. Sulphate Soda	5 lb. "	\$65	\$ 0.563
1 lb. 9 oz. Carbonate Soda	1 lb. "	\$4.95	.203
180 gram Metol	5 lb. "	\$3.50	.122
8 oz. Hydrochinon	1 lb. "	.48	.350
1/2 doz. Bromide Potas	1 lb. "	.58	.634
400 gr Citric acid	1 lb. "	.50	.038
2 oz. Potas Metabисульфит	1 lb. "		.063
10 gal. water.			

\$1.373

Cost per gallon \$ 0.137
 Cost of developer per 1000 feet film developed \$ 0.753

Hypo Solution.

2 lbs hypo in 1 gallon U.S.

Hardener . 2 oz per gallon. " "

Hardener { Acetic acid 15 oz
 Sulphate of Soda 2 lb
 Alum 1 oz.

Hypo costs about 3¢ per lb.

3300

17
Tues. Oct 8⁷ 1913

#1 First test film showing still object.

A group of miscellaneous objects were set up and photographed. Arc lights in the Laboratory were used.

The best amount of exposure for light conditions was determined by a trial piece of film which ~~was~~ was then developed in the dark room of the H.K. Film Plant.

A piece 4 feet long, 2 ft of which had been exposed to the red lights in my dark room for 45 minutes, was also developed at the Home P.K. Film Plant. The entire 4 feet of this film came out perfectly clear, showing the my ruby lights were perfectly safe and that film could safely be opened and handled in my dark room without danger of "fogging".

2411.1 X 2

G&E.

$$4 \text{ ft } 22\frac{1}{2} \text{ in} = 5.875 \text{ ft}$$

$$\frac{33.875}{38.875 \text{ ft.}} \text{ passed same point}$$

in 37 min 16.6 sec or 37.27 min

$$\frac{38.875}{37.27} = 1.043 \text{ ft film per min} \rightarrow$$

3300

Tues. Oct 8, 1913

Data readings taken at end of test - after 33 feet of negative passed through the developer tray.

Room temperature	70° F
Cooling water "	56° F
Developer "	68° F

37 minutes 16.6 seconds between start of film entering developer and end of film leaving developer.

4 ft 22½ inches of film always in developer tray (during this test)

Amounts of solutions left in reservoir:

Developer res.	2700	cc
Hypo	3150	cc
Glycerine	2100	cc

By mistake the hypo valve was closed during most of this run. Consequently the negative was not thoroughly fixed due to the hypo in the tray becoming weak. This film looks very promising.

Mr. Bretison - a photographer at Bronx.

3300

Wed. Oct 9, 1913

In order to get negative film ~~under~~ as nearly as possible under conditions of standard practice, I telephoned to

Mr. Horace G. Plympton, Manager of Bronx Studio to get his consent for permission that I be allowed to make an exposure with my camera set beside the studio camera.

I met Mr. Pheiss, the Head Camera man.

Took 180 feet of two scenes

Returned to the Laboratory Wed night and worked until 2 AM developing etc. this negative.

Humidity of air at 73° is .82
find humidity of this air after
it is heated to 84°F.

Vapor pressure of water vapor at 73° = 26.98 cm Hg.

35.49 at 80°F
23.33 at 70°F
12.16 diff.

3.698
23.33
26.98 cm Hg at 73°F.

Vapor pressure of water vapor at 84°F = 42.31 cm

52.55 at 90°F
35.49 at 80°F

17.06
6.824
35.49
42.31 cm Hg.

$$\therefore \frac{82 \times 26.98}{42.31} = .52 \text{ relative humidity at } 84^\circ\text{F.}$$

3300

Wed. Oct 8, 1913

development of negative which I
took at the Brown Studio.

Wed. Oct 8, 1913

No. 1582 or "What does it
profit a man?"

170
150 feet. film.

Readings at finish of developing:

Room temperature	74°F
Room humidity (Dry 75° - Wet 71°)	82
Cooling water temperature	56°F
Developer temperature	71°F
Hypo	72°F
humidity outside (dry 73° - Wet 69°)	82

Film drying Tower

84°F

Temperature
Humidity (dry 84° - Wet 73°)
no talk - how stable

Length of film
in developer tray 5 ft 10 1/2 inches
in Hypo tray 7 ft 2 in.

3300

Wed. Oct 8, 1913

cont'd

159 minutes 55 seconds — the
time interval required for ¹⁷⁰ft
of film to pass one point.
 $\frac{159.9 \text{ min}}{1.631} = 98.6 \text{ ft per minute}$

∴ each individual exposure was in
developer solution 3.602 min.

$$\frac{5.875 \text{ ft}}{.938 \text{ min}} = 6.27 \text{ minutes}$$

and in the Hypo solution

$$\frac{7.666}{.938} = 8.17 \text{ minutes}$$

Last end of film left the developer
tray at 12:07 AM, and
reached the reel at 1:51 AM
or 104 minutes later.

$1.04 \times .938 = 97\frac{1}{2}$ feet of film
between and near end of developer
tray and the winding on film reel.

1
at

2909
~~3300~~

Thurs. Oct 9, 13.

Work on Home P.K.
See other book.

cut

3300

19
Friday Oct 10, 1913.

Work on reports etc.

3300

Sat. Oct 11, 1913.

Had Reis send order to Mr. Farnel. I saw Farnel personally and he had an order to Mr. Jamison made which I carried with me.

Mr. Jamison developed a short test piece of positive and then had 170 ft. pieces of positive made ~~for~~ printed only, not developed, from my negative which I photographed at the Broom and afterward developed in the automatic machine.

The test was printed No 3. but it was decided to give the positive a little more time, making it No 5.

Mr. Jamison then gave me 1 gal of Edinol stock developer.

I mixed 4 gallons of hypo solution — 12 lbs hypo to 4 gallons water. To this I added 60 cc formaldehyde.

3300

Sat. Oct 11, 1913.

5 min 47 sec to travel 5,875 ft.
5 " 50 " " " " "

film set to 5 ft 1" in devel
this gives 5 minutes in devel.

first end of film entered developer
at 3:30:10 PM.

The chain broke when about 2 ft
film had passed into developer tray.

This was repaired at 5 PM.

Suggestion: the shafts should be
 $\frac{3}{8}$ " dia and the ^{chain}sprockets
should be larger — about 4" dia.

Night

3300

Sat Oct 11, 1913.

Returned to Lab at 7:30 P.M.
started film motor to test chain.
The shaft which carries the last
driving sprocket and also the large
sprocket gear ran badly out of
true. Consequently the chain climbed
off the sprocket gear and the same chain
which broke before broke again in a
different position.

Repaired the chain with two
new pins and put in two new
shafts.

Tested out again. Chain broke
again. I find that the chains
are stretching. Consequently the
chain becomes loose enough to climb
up upon the sprocket, thereby subjecting
the machine to great strain.

Will have Mr. Duke make some
adjustments to take up slack.

2909

Mon. Oct 13, 13

Worked on Home Kinetoscopes

2909

Tues. Oct 14, 13

Morning — worked on
home Kinetoscopes

3300

Afternoon

19 1/2

Past up idlers on chains
and put in two new shefts

Weather report of New York Time for
Wed. Oct 15, 13 - Thursday Times.

48°F at 8 AM.
55°F at 8 PM
63°F at 3:50 PM Map
64 Humidity at 8 AM
60 " " 8 PM
29.94 Barometer at 8 AM
22.82 " 8 PM.

3300

Wed Oct 15, 13.

Start of Test:

Room temp.
Outside temp
Cooling water temp
Developer temp.
outside humidity 61° 51°
room humidity 63°-57°

65
57°F
63°F
61°F

11:45:45 Start { in Developer
2:18:00 end {
2:33:45 out of hypo.
2:56:10 outside dry
3:43 finish

After test

Outside temperature
Room Temp
Outside temp 68°-59°
Cooling water temp
Developer temp
dry ing temp
Room humidity 75-63
72-64

68°
70°
59
66°F
66°F
80°F
51
65

Film in Developer 6 ft long.
166 ft film went through

(75)

21 1/2

000

3300

Cont'd

Thurs. Oct 16, 13

At the start of this test the room was very cold; and cooling water and developer were also too cold.

The ~~room~~ regulator for the room temperature regulation was set at 70° in order to heat the room, and the tap water which was nearly at the night temperature was allowed to replace the ice-tempered water previously used for cooling water in the jacket.

The temperature readings etc. were more nearly representative of conditions than when the conditions at start are considered.

Outdoor temperature

68°F

" Humidity

60.0

Room Temperature

70°F

Cooling water in jacket

66°F

Developer temperature

66°F

Air Temp in Drying Tower

68°F

" Humidity " " "

60

Because of an accident in the drying tower at the beginning of the test, the film ran off one sprocket roll and as a result the film made only four passes through the tower while normally eight passes were used. Also because of some trouble with the steam radiator, the heat in the drying tower was on only at the very finish of the test.

But since the day was bright and clear with fairly dry air, the film had plenty of time to dry.

Nov. 3, 13.

Emerson Electric Co.

Shunt

1800 R.P.M. - $\frac{1}{20}$ H.P.

110 volt .7 amp.

Direct current motor used
to elevate cooling water to the higher head.

Edgemoor Dynamo & Motor Co.
Belleville N.J.

$\frac{1}{2}$ H.P. Volts 110

15 R.P.M. Amp. 0.8

Direct Current to wind up
the film.

O.F. Sturtevant Co. Boston Mass.

Size 2 110 volts

2 amp.

Shunt current 3400 R.P.M.

Fan size B - 300 cu ft.

Westinghouse Elec Co. Pittsburgh

Direct Current Motor

Shunt wind; constant speed, continuous
duty.

$\frac{1}{6}$ H.P.

110 volts

.72 amp

1300 R.P.M.

Thurs. Dec. 4, 13.

Mr. Edison called Mr. Hutchison and I and wanted to know what had been done upon the automatic machine for developing its motion picture film.

We showed him the last positive which I had photographed at the Bronx and the negative of which had also been developed in this machine.

Mr. Edison asked what capacity the machine had, 1 foot per minute.

He then suggested using them in multiple units. That is putting six film sprocket rolls on each shaft.

Mr. Hutchison said that beyond develop another film and then Mr. Edison could see the machine in operation.

#3300

Dec. 15, 13.

Printer from Bob Kent, Sunday evening.
For Ball Bearings:

S. Britz Co. N.Y.
Auburn Ball Bearing Co.
Rochester, N.Y.

Ind. Eng.

Ind. Eng.

Temperature Regulation:
The Bristol Co. Waterbury, Conn.

Ind. Eng.

Thwing Instrument Co.
447 North Fifth St.
Philadelphia, Pa.
200 Fifth Av. N.Y.C.

Ind. Eng.

C. J. Tagliabue
Manufacturing Co.

18 to 88. 33rd St Brooklyn, N.Y.

Ind. Eng.

Best to vary the temp of coils or quantity
of air?

Blowers:

Leiman Bros 627 John St N.Y.C.

Ind. Eng.

Connersville Co.
Connersville, Ind.

Wilkins was on the trip.

Drill rod was $\frac{3}{32}$ " dia.
Proposed shafts to be about $\frac{5}{16}$ to $\frac{3}{8}$ "

3300

Refrigeration:

Carbondale Machine Co
30 Church St. NYC.

Mention Bob when writing to Henry Torrance
about passing air over Brine coils.

Chain:

James M. Dodge.
Linch Bolt Co Phil.

State problem and ask if Dodge chain
will work. mention Bob.

Gears:

Brown & Sharpe.

- Mr. Edison saw the machine
Saturday and made the following suggestions.
1. Increase capacity by spreading the
film 10 times or making it 10 ft
per min. Hutch suggested 30 ft.
 2. Developer tray to be in one length.
Machine to run full length of building
if necessary.
 3. Developer to flow in near exit of
film, thus having the weakest developer

Dec. 15, 13.

3. When the film is twisted in order to bring it into trays of different planes, the film is subject to greater stress at its edges and therefore is likely to stretch unevenly which may show up in projection and buckling.

4. The emulsion side next to the sprocket rolls is less likely to be scratched than when emulsion side is next to the tank because the relative motion between film and sprocket is zero while the emulsion side next to tank rubs ~~along~~ the entire length of tank.

3300

Mon. Dec. 15, 13.

acting upon the film at start and finishing up with strong developer.

Thoughts to be remembered:

1. All sprocket rolls should be fast to shaft and shaft to turn loosely in Ball bearings clear from all binders.

2. Rapidly moving film, preched holes acting as little buckets, will carry considerable solution with it from the trays. Hence is it not best to have weak solution near exit of film, strong solution entering with film?

Shower to test different metals in solutions of hypo and developer, I cut into small strips the following and put them in bottles of these solutions

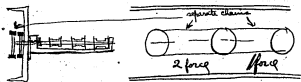
Aluminum

Copper

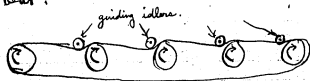
Normal Metal.

Notes on Warner's drying machine:

1. Sprocket fasteners seem good. Quicker than clipless paper fastener.
2. small chain drive. 4" sprockets. Upper row of sprocket rolls are all drivers, all supported from 6" channel, and casting



I think one heavy chain would be best:



3. Warner uses the commercial film sprocket but I think my special one is better.
4. Warner uses a wooden cylinder weighted at the bottom of film loops to act as take ups. not complete 200's.

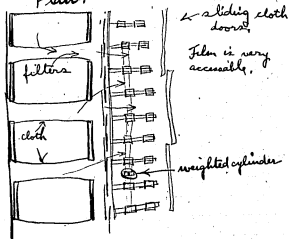
33.00

Mon. Dec. 15, 13,
Monel metal or nickel alloy.
Biddle Hardware Co.
160 Chambers St.

Temperature Regulator Thermostat
Am. Radiator Co.
140 W. 42d St N.Y.C.

No. 1 L.H.B.H. Delivery Service Am.
Blower #60⁰⁰. used for ventilation
and temperature regulation.

5 Notes on Warner Dryer:
Plan.

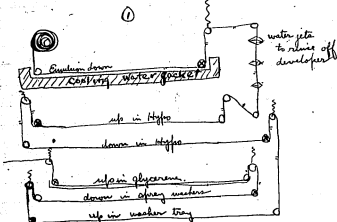


6. Warner has a felt wheel, kept wet with dropping water to wash off the glycerine from the celluloid side.
7. Jet of compressed air blows excess of water off leaving the celluloid side dry and clean.
8. Warner can dry in 75 minutes to 1 hr. He was running it at 20 ft per min. drying 700 ft in 35 minutes.
800 ft in 30 minutes now
250 ft per 10 ft speed.

33.00

Mon. Dec. 15, 13.

Suggestions for arrangement of trays and passes of film:



film passes over 21 sprocket rolls.

4 time in developer

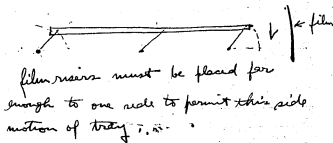
2 A time in Hypo

2 A time in Washer

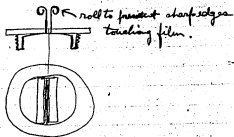
A time in glycerine

6 A length in machine

Suggestion:
 Solution tray to be supported
 upon link motion in order that tray
 can be lowered for quick loading of
 machine:



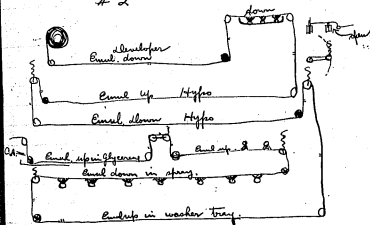
Suggestion for a sprinbler to be used
 on underside of film.



3300

2

Nov. Dec. 16, 13.



21 sprocket rolls.

A length in developer

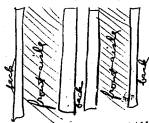
2A " in Hypo

3/2 A length in washer.

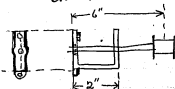
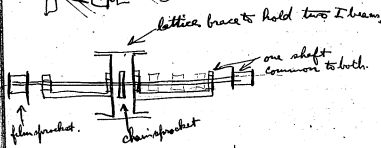
1/2 A length in glycerine

6 A length in machine.

suggestion for compounding two machines;



Plan view of four
machines -
run by two
attendants

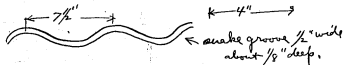
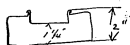


#3300

Tues. Dec. 16, 13.

Measurements from old machine,
developer tray

6 ft 2 3/4 x 2' x 3/4"



Hydro tray

7 ft 4 1/2 in x 2' x 3/4" with snake groove

Measurement of sprockets

16 teeth on small sprockets
60 " on large sprockets with crank,
one bracket per min. (about)

Glycerine Tray 4 ft 2" x 2' x 3/4"

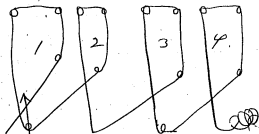
178 in or 15 ft in washers.
Seven pails of water.

Industrial Instrument Co.
Foxboro, Mass.

Recording Hygrometer

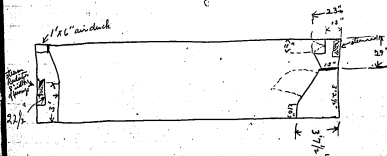
Size 8" One Rev. of chart 24 hrs.
Enamel Case and Nickel Plated Ring
\$88.00 - 10% = \$79.20 including
100 charts, bottle wks etc.

Range between freezing and
boiling points of water.



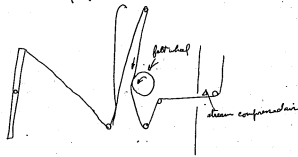
18 ft x 4 = 72 ft in dryer.

Room 15'6" high
5'7" wide
24'10" long

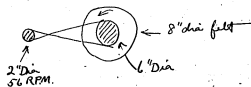


Dec 22.

Felt wheel to remove glycerine from back of film.



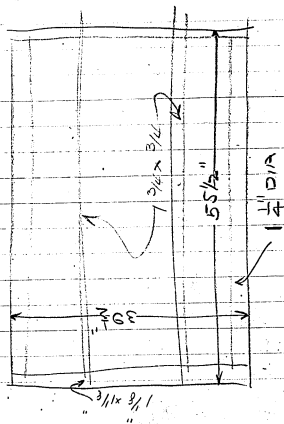
Film is traveling about 10 to 20 ft per min.



$$\frac{56}{3} \times \pi \times \frac{8}{12} = 39.1 \text{ ft per min surface speed.}$$

$$\text{relative surface speed } 39.1 - 10 = 29.1 \text{ ft.}^*$$

Racks used in film type of group studio



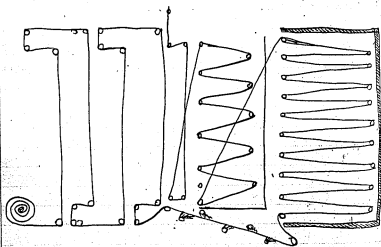
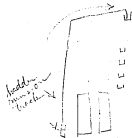
Handwritten
12-13-13

3300

Lat. Dec. 20, 13.

Makers of Wooden Tanks.
A. J. Corcoran Inc.
Tank Manufacturers
Jersey City, N. J.

for washing films, furnish ~~less~~
a stream of compressed air which
bubbling up from the bottom of the tank
scour off all hypro with the minimum
cost for water.



3300
3300

Mon. Dec. 22, 13.
Tues. Dec. 30, 13.

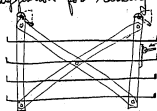
Calculations:

10 ft per minute.

Combined developer trays 60 ft.

4 trays 15 feet long.

Suggestion for raising trays;



Sprocket weight;



1 1/2
2 1/2

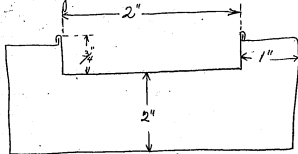
weight will below sprocket shaft.
to prevent same from swinging
or clanking up with film.

one model of pocket weighs 100 grams —
equals 0.22 lbs.

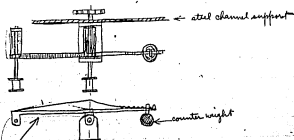
3300

Wed. Dec. 31, 13.

Cross section of Developer Tray.
water-jacketed:



detail of take-up. Hangers.



make the rock arm as light as possible — not
heavier than necessary to get good casting.

$$7.48 \text{ gal} = 1 \text{ cu ft}$$

$$\frac{(52 + 52) \times 66 \times 3.5 \times 7.48}{1728} = 104 \text{ gal} \quad \left(\frac{3}{2} \right)$$

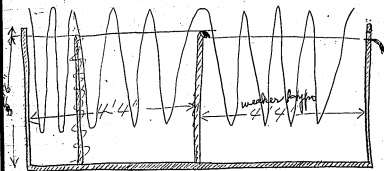
$$\frac{104 \times 66 \times 4 \times 7.48}{1728} = 119 \text{ gal} \quad (4)$$

$$\frac{(12 + 19 + 36) \times 66 \times 4 \times 7.48}{1728} = 76 \frac{1}{2} \text{ gal}$$

3300

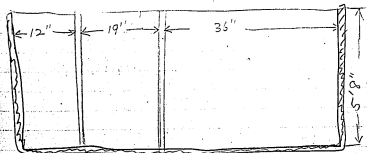
Wed. Dec. 31, 13.

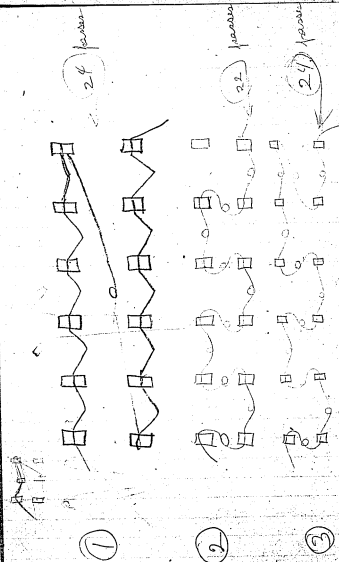
Details of Hydro Tank



depth of solution 5' 6"

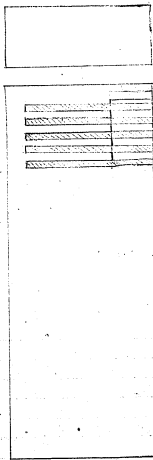
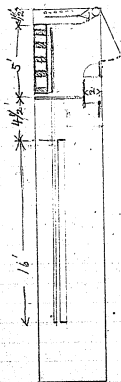
Water Tank

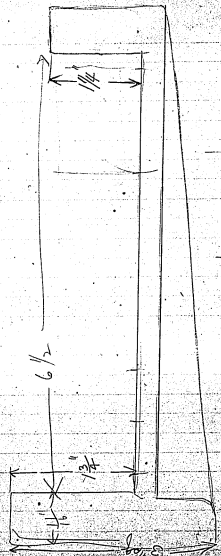




† 3300

Fri. Jan. 2, 1914.





9300

24 hours



⑦

Lat. Jan. 3, 1914.

6155

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Kinetophone and Kinetoscope Experiments -- A. M. Kennedy Books**

These six books were used by Absalom M. Kennedy during 1913-1914 primarily for experiments on the kinetophone. There are entries pertaining to the making of kinetophone recording outfits, adjustments based on recommendations or testing, and experiments with various motors and other parts. There are also recording tests to determine the optimal stage positions for actors and props as well as other filming conditions. Some of Kennedy's notes describe meetings of the "kinetophone experimenters" and the tasks assigned to them. A few relate to the recording experiments in Notebooks by Edison and Other Experimenters—Recorder and Recording Experiments—A. M. Kennedy Books. Several entries contain notations that Kennedy was reporting to Miller Reese Hutchison. In some cases, he received instructions directly from Edison on projects to be undertaken, along with comments and suggestions. The notes indicate that Adolph F. Gall, L. E. Hammond, Daniel Higham, Charles W. Luhr, and George J. Werner were doing similar kinetophone-related projects. A few experiments by Kennedy on kinetophones and motion picture film, as well as references to kinetophone demonstrations, can be found Notebooks by Edison and Other Experimenters—Recorder and Recording Experiments.

The five books with indications of oversight by Edison have been selected.

N-Number Labels and Inscriptions on Front Cover

Selected Books

13-04-20	"Kinetophone Studio Outfits"
14-01-01.3	"Jobs Undertaken. Jan. 1, 1914. & Kinetoscopes Ideas"
14-01-12	"Daily Record of Work from Jan. 12, 1914. to Aug 5 - 1914"
14-01-21	"Kinetophone Studio Work"
14-08-05	"Daily Record of Kinetophone Experiments from Aug. 5-1914 to"

Book Not Selected

13-08-08	"Kineto Phonograph Experiments. Conversations - Improvements"
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**Notebook Series -- Notebooks by Experimenters Other Than Edison
Kinetophone and Kinetoscope Experiments -- A. M. Kennedy Books
Notebook, N-13-04-20**

This notebook was used by Absalom M. Kennedy in April 1913 as a record of experimental work on the kinetophone. Included is a description of the making of three complete kinetophone recording outfits—one for Europe, another for the laboratory, and a third for reserve. The entries provide extensive details about each outfit, including camera, synchronizer, storage batteries, recording machine, amplifying machine, shaving machine, and blanks. They also describe adjustments made on the basis of recommendations or testing. Some final entries contain data regarding tests of business phonographs and motors. Also included are entries pertaining to meetings of the "kinetophone experimenters" and the tasks assigned to them. The notes indicate that Adolph F. Gall and George J. Werner were also doing kinetophone-related work and were consulted by Kennedy. There are tabs cut into the pages labeled "Camera," "Recorder," "Amplifier," "Shaver," and "Miscellaneous." The front cover and spine are each labeled "Kinetophone Studio Outfits." The pages are unnumbered. Approximately 50 pages have been used.

Acme Co.,

MFG. STATIONERS,
96 JOHN ST
AND
19 PLATT ST.
NEW YORK.

54472

*Am. Kennedy
Laboratory*

*Twiddle
Gentry
Shankens*

4/30/13.

MAKING 3. COMPLETE KINETOPHONE

RECORDING OUTFITS.

Three outfits complete to be made for, in order of importance:

1. Europe
2. Laboratory
3. Reserve

The first and third to consist of:

- (1) i. Converted Pathé Camera
 - a. to take 400 ft. nitro
 - b. to have 2" focus VOIGHTLANDER lens such as now used at Bronx (Physic. has data on this lens)
 - c. Registering device to show amount of film exposed.
 - d. 6 spool nitro to take 400 ft.
- Note - The camera is to be mounted on a table made for the purpose.

2. One synchronizing drive for camera having:
 - a- low voltage motor to operate from storage battery.
 - b- Carbon pile rheostat for motor speed control.
 - c- Counter shaft, chain drive and balance wheel.

3. One table for camera and synchronizer drive.

4. ⁽³⁾ Set of storage batteries for operating camera etc.

5. One recording machine complete, spring drive, and having:

- a- One dozen records complete.
- b- Two dozen recording stylus:
(0.38" diameter, cupped with
135" lap)

- c- 2 extra feed screws (1 feed note.

- d- Recording idler.

- e- Recording Machine Pedestal

- f- Synchronizer cord tightener and pedestal.

6. One amplifying machine having:

- a- Low voltage motor to run from same storage battery.
- b- Carbon pile rheostat for same.
- c- 2 spark needle arms.
- 1044. d- 6 recording sapphires .024" diameter, cupped with .075" lap.
- e- 3 reproducer ball sapphires .037" diameter.
- 1045. f- 2 spare feed nuts (long short)
- g- protective case for device.

7 Shaving machine having:

- a- 1/2 H.P. motor drive for same storage battery.
- b- 12 shaving knives.
- c- 6 spare feed nuts.
- d- 1" feed screw.
- e- 6 ultra front centers.
- f- 6 " rear centers.
- ✓ g- 1 question blowers of ample size to care for recording, amplifying and shaving machines.

8. Blanks as follows:

- a- 50 blanks for recording
- b- 200 special cans for transporting blanks, to be hermetically sealed.

9. 1. Kinetophone complete with sapphire ball on reproducer and:

- a- Three extra sapphire lenses and jewels
- b- all repair parts as at present included in sets
- c- telephone outfit.

(10)

Added by Committee
1 microscope with light and mandrel for examining coal masters.

Laboratory Outfit should
consist of:

- 1 - Camera
 - a - same as studio
 - b - 7 spare reverts, 100 ft.
- 2 - Complete
- 3 - Complete
- 4 - Not necessary. Can find.
- 5 - Recording machine with:
 - a - three ultra recorders.
 - b - 1/2 doz recording styli as studio equipment.
- 6 - Amplifying Machine with
 - a - as studio equipment
 - b - "
 - c - "
 - d - only 7 sapphires
 - e - " 1 hard sapphire

7. - Shaving Machine and
a - 110 volt D.C. motor - $\frac{1}{2}$ HP
b - 2 Knives
c - 2 spare nuts
d - 1 screw
e - 2 front centers
f - 2 rear centers
g - Same as studio equipment.

8 - Will get blanks as need them.

9 - Same same

The duplicate equipment for the
Babel studio should be the
same as the European
outfit.

4/21/13

Meeting of Kinetophone
Experimenters.
(The record of meeting).

"A. x. Norton instructed to prepare a multi-phase (synchronous) motor driven recording phonograph and motion picture camera as early as practicable and subject same to rigid tests."

Gears to be substituted for chain ^{drive} recording, amplifying and showing machines.
(Gall volunteered to do this)

Combined helical gear and belt-pulley drive for amplifying machine.
(Gall instructed to do this)

On account of expansion of mandrels and shafts expanding spring centers instructed in place of solid. (Gall volunteered to attend)

Electrically heated box with
thermostat control to heat wax
cylinders in case to temperature
of room.
(R. to design)

Flat springs on steel end
of mandrel of all recording
machines, nickel, not buffed.
(R. to design)

Mandrels capable of sliding
on shafts to get alignment
by splint taper bearings
nuts. Amplifiers only.
(Glee to design)

Taper nuts, springs to be
twin. That on amplifiers to
have release knob.
(R. to look after Glee volunteered
on latter)

Speed adjusting screw to be
changed.
(Glee volunteered to do)

Top plate of recording machine
to be fastened to top of box
& hinged
(K to look after)

Recording machines to be
provided with lead fly wheel.
(K to look after)

Method of passing recording arm
by lever in place of sliding pen
on recording machine
(K to look after)

Tried nut spring screw holes
slotted for adjustment.
(K to look after)

Pedestal for recording machine
to be designed.
(Base unscrewed. Transferred to K)

All machines to be provided
with suction tubes for removing
chips.
(K to look after)

Phone conversation with Mr.
Seeming developed that
European equipment is to be
portable. This must be taken
into consideration on design.

Changes made from Original Design.

① It was found that variation in speed was caused by the fed nut on shaft pin not bearing pulling against the gear. This was changed.

② The machine was very noisy. This seems to have been caused by the friction roll running too slow. Rollers were changed so that the friction rolls speed was increased and much better tone was obtained.

At meeting of the Phonograph Experimenters Committee of 5/27/13, it was recommended that a new governor be used - that a fly wheel be put on the mandrel shaft and that the idler on friction roll drive belt be put on other or loose side.

Mark on machine developed
that:

Reamer worn drive gear
weak and buckled under strain.

Gaskets show wear.

Small amount of dirt in
bearings makes quite difference
in regulation, running and starting
of machine.

4/23/3.

Mr. Mervin reports that on account of static electricity, he has had to modify the Pathe Cameras he has fixed and:

- (1) Change hard rubber rollers on pistons for metal and remove velvet. He arranges also a slide over the piston outlet to prevent light from getting in when door is opened. This slide is operated by external lever.
- (2) Velvet removed from film guide and metal rollers substituted.
- (3) Ribbon removed from back of aperture cover and aluminum of this smoothed thoroughly.

He reports also that that the Pathe Camera possesses the following additional disadvantages:

- ① Extremely difficult to focus as door is on side furthest away from aperture.
- ② Two pistons used which hold only 200 ft of film each.
- ③ Unwieldy in size - both

wider and higher than
necessary due to double retorts
and spare retorts being kept in
camera case.

See that 2" Dagblender lens

^{4/25/3}
Present lens is Dagblender
appear to fit. Pathe motion
Picture Camera, 2" focus.

Reported that the mounts of
present Pathe cameras have been
changed and the above
Dagblender lens was for old
mount.

Camera should be provided with
Bender Cyclometers which will
record each foot of film used.
This may be placed on the crank
driving shaft.

Camera drive at Bronx Studio
is as follows:

Close to camera is fastened a pair
of gears driving a Bender Cyclometer

which Whigham reports, records
film used in 6" integrals.
Burrer out is a sprocket and
to this is affixed one portion
of a universal joint consisting
of a shouldered disc with two
pins. These pins engage in two
of four slots of a loose washer;
in the other two slots of which are
two pins of a rigidly shouldered
disc which is fastened to an
independent shaft which
with appropriate bearings carries
a 7" fly wheel, weighing apparently
about 6#. Next to the fly wheel
is a pulley with \vee grooves
for round belt, which is belt
to an Emerson, Type #12 Ed.

Speed 1800 - HP $\frac{1}{16}$ - 1100.9 amp
893457 D.C. motor. An extension
of the fly wheel shaft carries a
belt arranged to fit the crank
of the Camera for hand drive.

The sprocket is connected by
chain to the sprocket of synchronous
by a chain. The portion of gearing
of these two sprockets are apparently

about 2 to 1.

The motor is about 1 ft from the camera.

DeGham says that a series motor would do as well or better. The object desired here is to keep the motor locked so that it pulls steadily against the brake of the synchroizer.

The camera is fastened to table by castings through which are carried $\frac{1}{2}$ " rods with wing nuts.

4/20/13.

Order placed with Mr. Mudd
for 3 camera cases as per Mark's
drawings 4/23/13.

Order placed with Mr. Mudd
for 14 extra retorts for same
4/24/13.

Present machine to be used
and modified as follows:

- ① Chain drive for feed screw
to be changed to gear drive.
- ② Fixed centers on mandrel to
be replaced by spring centers.
- ③ Aluminum mandrel to be
changed to brass mandrel
and springs put on small
end.
- ④ Single feed nuts to be changed
to twin nuts & springs with
slotted screw holes so as to be
adjustable.
- ⑤ Speed adjusting knob to have
slotted head and not project
above bed plate. Should have
clamping arrangement to
prevent turning too freely.
- ⑥ Bed plate to be made fast to
top of case and top of case
ringed and provided with
feed up device.
- ⑦ Quotion tube similar to one
on shaving machine to be
provided and attached.

③ Lever left for raising recording arm in place of sliding pin as at present.

4/25/13.

Mr. Naraw has suggested that the recording arm of the recorder be mounted so as to slide on the present guide and that this sliding be regulated by a screw. That a microscope or other finder be located on this arm. The purpose of this will be to locate the target that cuts or paints from which the recorder was picked accurate - by if necessary to have a back on the record.

He also suggests a hook on which to hang the end of the loop of cord hooking up the recorder when same is not in use.

4/26/13.

Order placed with Mr. Rio for
6 pounds to be cast of Drexel
metal in place of melblamite for
trial.

A small blower such as
used in business phonograph
showers, enclosed in a box
to prevent noise may perhaps
be used to take dust away
from recorder

Thompson
Turner

Present machine to be used
modified as follows:

- ① Chain drive to feed nut to be changed to gear drive.
- ② Combined helical gear and belt drive with belt pulleys of slightly different diameters to be used for synchronous driving of the two mandrels.
- ③ Mandrels provided with split bearings & taper nuts so as to be adjustable on shaft with respect to each other.
- ④ Feed nuts and springs to be twin. Push on feed nut springs to relieve readily. Feed nut spring to have slotted screw holes for adjustment.
- ⑤ Suction tubes for removing chips to be provided.
- ⑥ Mandrels to be given thin coating of maktel.

4/25/13

Speed of amplifier should be
from 120 to 80 R.P.M. Should be
designed to vary this much by
having regular spring tension
on motor shaft, with
countershaft to reduce the
speed.

Forms for this work should
be 9 mm ph with extension
tube.

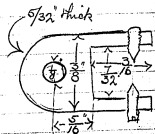
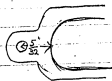
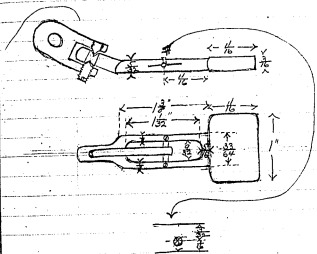
Present machine to be used,
modified as follows:

- ① Chain drive for feed screw
to be replaced by gear drive.
- ② Twin feed nuts & springs with
plotted screw heads to be used.
- ③ Brass mandrel, with light
plating of nickel, not lacquered
to be used.

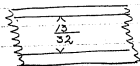
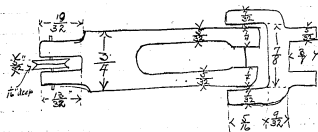
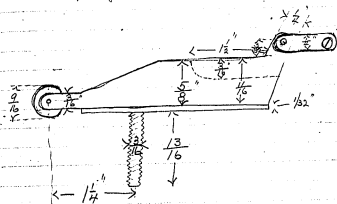
Gave reports 1/20 H.P. for shaving
machine needed.

Shaving machine runs in tool
department at about 700 R. P. M.

Amplifier Lens Arm.

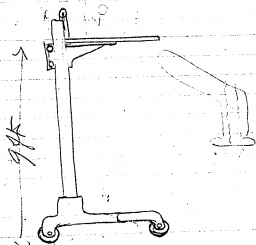


Amplifier Lever Arm Holder.



Design pedestal for recording
machine, arith and synchronizer.

Get suction blower to
suck wax chips from the
three machines.



Design for pedestal
by Gall.

Cooner - to make amplifying arms
Smith - draftsman

4/25/3.
The Recorder Pedestal should be
able to raise the recording phonograph
30-9 feet from the floor.

The suction blower should have
a direct connected motor of
sufficient size to give sufficient
suction.

A microscope adapted to examine
master records should be furnished
with each equipment.

Test of Business Phonograph 26. Motor - Old Style

Speed	Amps.	Vac. to
1500	.7	30
1250	.76	29.75
1000	.82	29.4
800	.87	29
600	.92	28.6
500	.97	28.4
400	1.00	28.2
300	1.01	27.9 ^{gum} _{rolls}
800	.89	29.5
600	.94	29.3
500	.98	29.2
400	1.00	29
300	1.01	28.8
250	1.03	28.7
200	1.05	28.1
150	1.05	28.5
100	1.06	28.3
0	1.1	28.25

*Test of Business Phonograph,
D.C. Motor - Old Style.*

<i>Speed</i>	<i>Amps.</i>	<i>Cost.</i>
1500	.55	25.25
1250	.6	25.
1000	.7	25.
800	.75	25.
700	.8	25.
600	.8	25.
500	.85	25.
400	.87	25.
300	.9	25.
200	.94	25.
150	.96	25.
100	.98	25.
75	1.00	25.

Motors:

T.A.E. Inc. - East Dept. make
two styles of motors.

50 H.P. - Shunt or series wound
for any voltage D.C.
#0 H.P. Series wound to 30
volts D.C.

The latter has extension shaft
with spring governor mounted
on for Edison Lighting Regulator.

Test of TAE Inc. House Lighting
Contractor Motor with Business
Phonograph Blower.

No feet	Feet	Amps.	Blower	Speed of Motor
15	17.5	.3	750	310
20	21.25	.35	1600	675
25	30.6	.35	3500	1000
30	34.75	.4	3000	1140
35	39.	.41	3400	1300
40	42.8	.42	3700	1500
45	47.	.45	4000	1725
50	51.5	.48		1840
55	56.	.5		2120
60	61.5	.51		2480
65	67.	.53		2625
70	75.	.55		2920
75	80.	.57		3600

Made by Hammond

Patterns for Shaun & Gordon
bases said to be at Reuther Bros
Mr. Reaser Mr. Mudd knows them.

Size of master record cans
1 6/8" diam x 9 1/2" high all

Test of House Lighting Type Motor

Test No. 1

Volts	Amps.	Speed	Weight - Grams	H.P.	Efficiency
43	1.1	500	3 1/4 lbs	.01	16%
43	.9	1000	2 1/2 "	.015	30%
43	.8	1500	1 3/4 "	.016	35%
43	.7	2000	1 1/2 "	.018	44%
43	.6	2500	1 "	.015	43%
43	.5	3000	3/4 "	.013	45%

Test # 2

43	1.2	250	3 1/2 lbs	.004	57%
43	1.1	500	3 "	.009	14%
43	.95	1000	2 1/2 "	.013	24%
43	.8	1500	1 3/4 "	.016	35%
43	.7	2000	1 1/4 "	.018	44%
43	.6	2500	1 "	.015	43%
43	.5	3000	3/4 "	.013	45%
43	.4	3500	1/4 "	.005	21%

Test of House Lighting
Type Motor
Test # 3.

Volts	Amps.	Speed	Weight - lbm	H.P.	Frequency
4 1/2	1.2	250	3.25		
4 1/2	1.1	500	2.75		
4 1/2	.95	1000	2.25		
4 1/2	.82	1500	1.75		
4 1/2	.68	2000	1.25		
4 1/2	.55	2500	.75		
4 1/2	.6 (2)	3000	.5		

Last

Test of Business Phonograph D-C Old style

Speed	Volts	Amps.	Wgt. 6 arm	H.P.	Efficiency
250	36.5	1.4	3.25	.004	6%
500	36.5	1.3	2.75	.008	13%
1000	36.5	1.1	2.25	.013	24%
1500	36.5	1.	1.75	.015	31%
2000	36.5	.85	1.25	.015	36%
2500	36.5	.70	.75	.011	33%
3000	36.5	.60	.50	.009	30%
3500	36.5	.55	.25	.005	17%

	Test	#	2.		
250	43	1.8	4.25	.005	5%
500	43	1.6	3.75	.011	12%
1000	43	1.4	3.00	.018	22%
1500	43	1.2	2.25	.02	29%
2000	43	1.1	1.75	.021	33%
2500	43	1.	1.25	.018	31%
3000	43	.9	.75	.013	25%

Speeds of 12 watt. motors
ordered from Electrical Dept. for
Brooks Studio.

Business Phonograph O.B. motor, old
style, ordered for Amplifiers:

10 watts	550 R.P.M.
11 "	625 "
12 "	695 "
13 "	825 "
14 "	925 "

New style enclosed phoning machine
motor, as proposed for khetophones.

10 watts	- 1100 R.P.M.
11 "	- 1300 "
12 "	- 1375 "
13 "	- 1460 "
14 "	- 1550 "

Test of 1/2 watt motor, rewound
Business Phonograph, Geo. City, Tenn.

Running free.	Overruned.
Volts 12	Volts 11.6
Amp 5	Amp 5.4
Speed 1820 R.P.M.	Speed 1500.

This motor is wound with
#20 wire on armature and #18
on fields. It gives sufficient
speed and power on 6 volts.
for running the amplifier with
countershaft.

Motor wound with 22-24
wire on armature and 20-22 on
fields will do the work on
1/2 volts.

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Kinetophone and Kinetoscope Experiments -- A. M. Kennedy Books
Notebook, N-14-01-01.3**

This notebook was used by Absalom M. Kennedy during January-February 1914 as a record of experimental work on the kinetophone. There are a few additional entries from December 1914 and January 1915. Included are experiments on frictional reproduction, motor regulation, and synchronous motors. The entries describe comparison tests between various brands of equipment, as well as inspections of records and reels for foreign orders. Also included are tests on kinetoscope shutters and film cement. At the end of the book is a list of ideas for improving the kinetoscope. The notes indicate that Kennedy received instructions directly from Edison on the work to be performed, along with comments and suggestions. There are also indications that John W. Farrell, Adolph F. Gall, Daniel Higham, and Charles W. Luhr were involved in similar work. The front cover is labeled "Jobs Undertaken. Jan. 1, 1914. & Kinetoscopes Ideas." The book contains 200 numbered pages and an index; many pages are blank.

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0010

Kinetophone Experiments 0011

Frictional Reproduction.

Mr. Edison outlined shoe and roll, latter if steel roughened as by sand blast with the edges just knocked off shoe of similar surface made to fit. Anticipates that the shoe and roll will vibrate and produce here with the vibrating movements of sound waves.

1/2/14 Mr. Kuhl completed 2 rolls.
1/5/14 Little assigned to making shoes.
1/6/14 Showed steel roll aspect of shoe to Mr. E. Did not like it and ordered roll made of german silver.

1/12/14 Little made sample of german silver shoe & shoe, lightly etched. This reproduced fairly well in quality but did not have enough friction or volume. Made two others, one flat, one with regular grooves and etched deeper which about the same results.

1/20/14 Made shoe of filine run on amber roll. Friction fair, quality good, volume good.

0016

Kinetophone Experiment 0017
Motor Regulation

Mr. Edison detected varying tone in Kinetophonograph which was assigned to the slipping belt mechanism of governing. Suggested use of old type M.H. motor which make a weak governor. This was tried but without good results due to the frail mechanism of fastening the armature to shaft. Work was not however completed.

Kinetophone Experiments: 0023

Synchronous Motors for Running Kinetophonograph and Kinetoscope.

Norton made up a motor-generator to transform D.C. into two phase A.C. and a synchronous motor to be run from same, former to operate the Kinetoscope and latter the Kinetophonograph. First developed that latter could run at $\frac{1}{4}$ speed with former. Also that unless fields were carefully adjusted, the motor-generator would run away. Speed of motor-generator was adjusted by varying field strength.

Norton made up for me two alternating variable speed synchronous motors in which stators were connected in multiple to the A.C. line, Rotors were wound & connected to three collector rings which were connected together. In this way the armatures generated A.C. of different frequency and the speed at

0024

which there will now will
be the difference between the
frequency of the stator and
rotor.
Tests have not been completed.

0025

Kinetophone Studio Outfits 0029

To date two outfits have been supplied, one to Germany, one to Europe to be afterwards

1/9/14 Higham books on thickness of amplifier leather belts.

1/9/14 Mr. Nelson wants promise of earlier date on outfits.

1/10/14 After seeing Ruhr, promised outfits on 18th 30th

1/10/14 Put MacRae on job assembling

1/16/14 MacRae finished assembling
synchronizers, camelshaft
mounting camera on take

0034

0035

Test of Edison Economy
Transformer against
Port Wayne Compensare.

Port Wayne Compensare - 110 volts a.c.

Vantage Open Circuit 56.5
 Closed " 35.

At 53 amp. the following times were
 recorded in minutes -
 $4\frac{1}{2}$ - 5 - $5\frac{1}{2}$ - 5 - $5\frac{1}{2}$

Edison
 amp 35-40 = $5\frac{1}{4}$ - 5 - $4\frac{1}{4}$ - $4\frac{1}{2}$ min
 " 45 = 5 - 6 - $4\frac{3}{4}$ - 5 "
 " 55 = 4 - $5\frac{1}{4}$ - 5 - $5\frac{1}{2}$ "
 " 60 = $3\frac{1}{2}$ - 4 - $3\frac{3}{4}$

0036

0037

Vento

31	31.5	34	Closed
53	53.5	53.25	Open
34	33	34.5	Closed
53.25	53.38	53	Open
37	34	36	Closed
53.25	53.25	53.12	Open

0018

Ordered print of part 3D
to inspect and see if it could
be substituted for part 3C.

** Checked this record "any."
Complete films inspected and returned.

* 1/7/13 Received missing records of
Deaf mute, inspected them &
returned to the stock room.

1/7/13 Received from Reinhard
the following reels:

Travels	3
Musical Bonnets	6
French Lecture	4
German Lecture	5
After College Days	6
Parade	3

1/8/13 Received from Stock Room

5 Reels German Lecture
6 " After College Days
6 Films Ohio Minstrel
6 Records "
6 Records Musical Blacksmiths

0019

1 Reels French Lecture
3 " French
3 Sets " Travels

Also

1 Film In a Spanish Garden
1 Record French Lecture
1 Record
1 Film Campanari
1 Record
1 Film Afterpiece
1 Record
2 Films Musical Blacksmiths
3 Records " "
2 Films German Lecture
2 Records
2 Films Ohio Minstrel
2 Records " "
2 Films Travels
2 Sets Reels
3 Films College Days
3 Records " "
3 Films Two Shamrocks
3 Records " "

Ritter & Neumann assigned to inspect.

0050

1/9/14 Received from Stock

	Films	Records
Seymour, Dempsey & Seymour ¹⁻³	4	4
Dead Mute 1-5	4	4
John McPhaw 1-2	2	2
Bought in the list	1	1
for Channing Photos	.	.

1/10/14 Received from Stock

John McPhaw 1-2	4	4
Dead Mute 1-5	4	4
Seymour, Dempsey & Seymour ¹⁻³	3	4

1/10/14 Received

Polkman	1	
Belore A	1	
Seymour, Dempsey & Seymour	1	

1/16/14 Received

Riddle's Banquet	4	4
In Stone Scotland	2	2
Picture from Russia	2	2
Cynopsis	2	2
Chimes of Normandy	2	2
Singing Society	2	2

9051

Record
2 2
2 2

King & Mandy
Also Muralis

1/10/14 Russian Perceable
Greetings
Tues. Riante
Seymour, Dempsey & Seymour
The Dead Mute
John McPhaw
1/10/14 After Many Years a
B.C.

Which Shall I Be	1	2
Das Rote Herz "a"	1	1
Das Rote Herz "b"	1	1
Studententischen "B"	1	1
1/10/14 Das Rote Herz	2	2
Studententischen	5	5
1/10/14 Das Rote Herz	10	10
Studententischen	5	5

0052

0053

New Kineloscope Shutters.

^{1/16/14}
Suggested by Mr. Bell that since
greatest flicker occurs and least light
is needed for photo. throws, that
shutters be made having equal blades
for short throws and cutting down
film with the ~~same~~ ^{same} ~~longer~~ ^{longer}
throws for best results.

12/10/14 Doctor Schuster Schuster mounting
sample filament blades received
from Kineloscope Dept.

12/19/14 Schuster purchased two samples
1-3/80° blades, 1-9/90° blades.

Ill
one week

0054

2/11/14

0055

	Records	Reels
Das Rote Herz B	10	10
Einleitender Vortrag	10	10
Studententitten A	6	6
Studententitten B	4	4
Allen gegen Kommt Von Allen	10	10
Der Hanspuck	10	10
Hemmerische Oalserder	10	10
Der Politischen B	10	10
Verabend in Der Einheits	10	10
1813	10	10
The Old Violin	6	4
Myth Shall It Be	8	2
The German Reading	2	
The Musical Blacksmiths	1	
after Calais Days	1	
Eaton Minstrels	1	

0056

2/10/14

0057

Reels Reels

Humoristische Volkstänze	2	2
Der Hanselink	2	2
Feierabend in der Senkutte	2	2
The Old Violin	/	/
Jerry Mandy	/	/
Five Bachelors	/	/
The Mascot Act 1	/	/
" " " 2	/	/
" " " 3	/	/
Quette " 2 part 1	/	/
" " 2 1 2	/	/
The After piece	/	/
A Few Shamrocks from Ireland	/	/

0064

0065

New Film Cement and Recipe

Numerous complaints to Kinetoscope Department on film cement not holding and turning white.

Kinetoscope Department sent our sample bottle of "Bull Dog" cement made by the "One Drop Oil Co.", Chicago. Tested this out. Consists of volatile celluloid solvents of which acetone prevails as an ingredient. Cements are provided plenty is used and film is clamped good and tight for about 30 to 35 seconds.

Made up cement to duplicate this consisting of

- Denatured Alcohol	3 parts
Acetone	2 "
Benzole	1 "

Makes apparently almost the same as "Bull Dog". Makes firm unbreakable joints but tends to turn or warp with respect to film. Will try and

0066

0067

eliminate this by adding a few drops of castor oil or a little camphor and use wood in place of denatured alcohol.

Mr. Critchiz on report that the water in Denatured Alcohol will cause film to turn white and to try absolute alcohol instead.

Mr. Farrell suggested that camel hair quill brush be used in place of Tampico brush in tin as present and that this brush be fastened to the cork. Made up sample which was accepted by Farrell and rejected by Critchison because cork was not long enough to get head of.

0070

0071

Continued Reproduction
Height and Mirror.

Suggested by Higham.

1/6/15 - Sketch given Austin-Skinner

1/7/15 - Model finished by "

- 1 - Hervey +
- 2 - Burt
- 3 - Ochs
- 4 -
- 5 -
- 6 -
- 7 -
- 8 } Spare
- 9 }

Ideas for Improvement of Kinetoscope. Hammond-

- ① Eliminate useless gears between main shaft and shutter shaft.
- ② Extend main and intermill shaft and enclose intermill in oil case.
- ③ Round spring clip on top magazine door.
- ④ Elimination of extension shadow box on B & L. lens.
- ⑤ Extension removable shutter shaft for packing.
- ⑥ Tool to turn back eccentric bushings on sprocket shaft simultaneously.
- ⑦ Quick back switch

[ITEM(S) FOUND IN BOOK]

Voltage Open Circuit
56.5

Voltage Closed Circuit
Arc. 35.

Turns
1 1/2 - 5 - 5 1/2 - 5 - 5 1/2
min of arc

Amp. 53

Edison

Low	High
4	5
4 1/2	5 1/2
5	6
5 1/2	6 1/2
6	7

[ITEM(S) FOUND IN BOOK]

Volts

Amperage			
Low	Medium	High	
62	63	68	Closed
106	107	106.5	Open
68	66	69	Closed
106.5	106.75	106	Open
74	68	72	Closed
106.5	106.5	106.25	Open

Edison Transformers		
Amperes	arc	Time
35-40	$\frac{1}{16}$ "	5 $\frac{1}{4}$ min 5. 4 $\frac{1}{4}$. 4 $\frac{1}{2}$.
45	$\frac{1}{16}$ "	5. 6. 4 $\frac{1}{4}$. 5.
55	$\frac{1}{16}$ "	5 $\frac{1}{4}$. 5. 5 $\frac{1}{2}$. 4 $\frac{1}{2}$.
0	$\frac{1}{16}$ "	3 $\frac{1}{2}$ 4. 3 $\frac{3}{4}$

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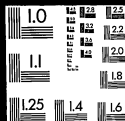


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